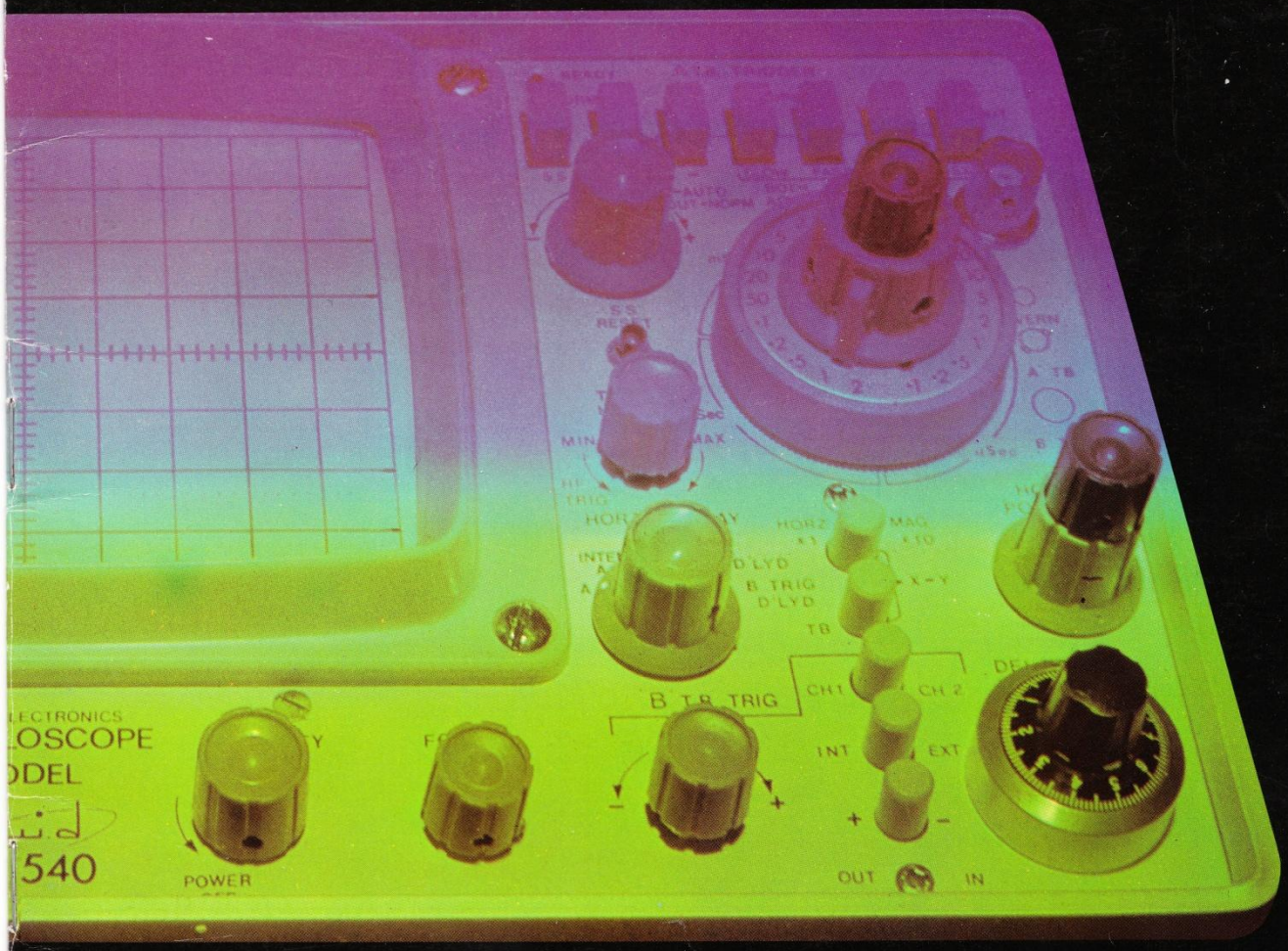
BWD



ELECTRONIC
TEST INSTRUMENTS
Shortform catalogue Nº7

BWD Electronics Pty. Ltd.

Introduction

ABOUT BWD ELECTRONICS.

BWD Electronics Pty. Ltd. was formed in 1955 to produce electronic test instruments for the Australian industry. As a wholly Australian owned company, BWD has moved forward at a rapid but controlled growth rate maintaining its leadership in the development of creative designs. The results of this technological expertise are evident from the range of instruments manufactured, each one designed and produced to high standards and incorporating features which make them unique amongst world wide competition.

RESEARCH AND DEVELOPMENT

The origination of a well designed electronic instrument depends a great deal on team work. The circuit arrangement, mechanical construction, styling and ergonomic considerations all form part of the overall design. At BWD, therefore, each new design is produced by electronic and mechanical engineers working together as a development group in the same laboratory under the leadership of a senior engineer. This system ensures the fullest contribution from each discipline, with the minimum of interfacing problems.
Comprehensive prototype field and environmental testing is conducted before committing new designs to production. In many cases several variants of a design are produced to evaluate variations in layout and performance.
In the final form, standard instruments may often be modified to meet a variety of special applications, and the wide experience of BWD engineers is available to assist in solving the problem.

STANDARDS OF QUALITY

Considerable stress is laid on the need to maintain the quality of BWD products and, to this end, much engineering effort is devoted to special test methods over and above the normal routine test and alignment. These methods include shock and vibration testing and performance measurements under overload conditions and at simulated climatic extremes. They are applied at all stages of development as well as to the complete instrument.
All newly developed devices are thoroughly investigated by quality control engineers before integration into an instrument design, and the same philosophy is followed regarding the use of new materials and components. BWD certifies most instruments with an individual performance sheet stating the actual tested characteristics compared with the published specification.
Extensive testing, including vibration or drop tests, on every instrument leaving the production line ensures maximum reliability and continuity of operation to performance specification.

NOTE 6625 etc. numbers appearing with the BWD model number are Defence Stock Numbers awarded to the instrument.

CUSTOMER SUPPORT SERVICE

An instrument on its own is of little use if it cannot be applied to the required task.
Our engineers are technical staff are therefore always available to assist with application information for BWD instruments as part of the customer service.

MARKETING

BWD equipment is actively marketed in Australia through State sales outlets, staffed by qualified engineers, factory instructed in all equipments of the BWD range.
BWD equipment is also exported to a rapidly expanding World Market through approved Dealers.
BWD is a supplier of Electronic instrumentation to major Government Departments, Defence Services, Universities, Education Departments, Hospitals, Research and Industrial Laboratories.
BWD operates a highly skilled technical sales force to support the company philosophy that customer satisfaction now is the surest path to further sales.

ADDITIONAL PUBLICATIONS

1. Technical Data Sheets.
These are individual sheets which contain complete information for each instrument described in this catalogue.
2. Handbooks.
A comprehensive handbook is supplied with each instrument and additional copies are available for a nominal charge.

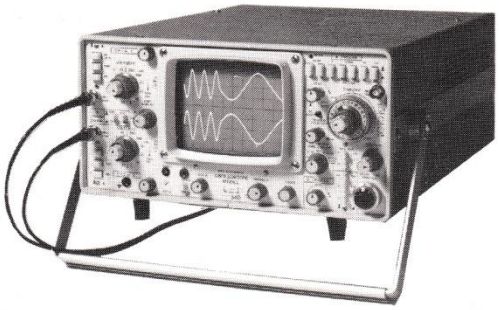
AUSTRALIAN SALES & SERVICE CENTRES

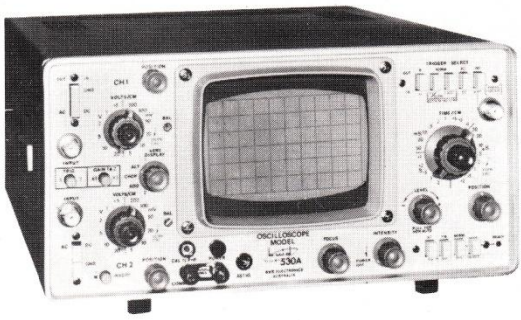
See inside back cover for your nearest location.
EXPORT enquiries from outside Australia contact the Head Office.

NOTE All dimensions are shown in the sequence, width, height, depth.

BWD Electronics Pty. Ltd., Miles Street, Mulgrave, Victoria

Portable Oscilloscopes

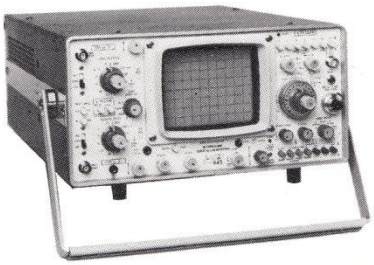




	540 (6625-66-083-0505) (6625-66-083-0504)	530A (6625-66-081-1312)
	The BWD540 dual channel 100 MHz oscilloscope provides the high performance and accuracy required in laboratory applications with light weight field portability. Operation is available from AC or DC power or an optional "easy fit" rechargeable battery pack. Both vertical channels sensitivity range extends from 5mV to 20V/div by a 12 step attenuator. Channel 1 gain can also be increased to 1mV/div by a x5 gain switch. The main time base sweeps from 5nSec to 5Sec/div and the delayed time base from 5nSec to 1Sec/div. Mixed, delayed sweep or delayed trigger are selectable with independent source, polarity and level select for the delayed trigger. Other trigger features include variable hold off and TV line and frame. Internal trigger take off is immediately after the attenuator input stage. Although the facilities are very comprehensive, operational simplicity is established by logical control layout.	A compact high performance dual trace oscilloscope featuring a high intensity 6 x 10 cm CRT with an internal graticule. Identical vertical amplifiers with DC to 20MHz bandwidth at 1mV/cm, signal delay line and an isolated ground line for 'in circuit' measurements are complemented by a 40nSec to 10Sec/cm time base and stable DC to 30MHz triggering range. TV line and frame lock, identical X-Y operation, DC coupled Z modulation and an optional AC/DC/rechargeable battery power supply complete the instrument's generous specification.
CRT	8 x 10 cm rectangular, internal illuminated graticule P31 or P7 phosphor.	6 x 10 cm rectangular, internal graticule. P31 or P7 phosphor.
EHT	12kV	4kV
Display Area	8 x 10 cm. Full deflection both channels.	6 x 10 cm. Full deflection by both channels.
Z Modulation	DC to >10MHz Input 4.7kΩ & 10pF 0 to +2V for full modulation. Max input ±30V.	Input 2.2kΩ 0 to +5V for full modulation DC–10MHz
VERTICAL AMP.		
Bandwidth	DC to 100MHz) Both channels	DC to 30MHz) Channel 1 only at x5 gain
Sensitivity	5mV to 50V/div) Both channels	1mV to 4V/div) Channel 1 only at x5 gain
Rise Time	4nSec) Both channels	10nSec) Channel 1 only at x5 gain
Input	1MΩ & 26pF	DC to 20MHz-3db) Both channels
CMRR	>20db DC to 20MHz with vernier adjusted for optimum rejection	1mV to 20V/cm) Both channels
Attenuator	1, 2, 5, 10 sequence & vernier	17nSec 1MΩ & 30pF 1, 2, 5, 10 sequence & vernier
Display Modes	Beam switching – Alternate, chopped, (500kHz) Chan. 1 only, Chan. 2 only, Chan. 1 & 2 add or subtract.	Alternate, chopped (250kHz) Chan. 1 or 2 Add Chan. 1 +2 or 1–2
Common Line	Grounded	Isolated to ±400V DC
TIME BASE	MAIN OR DELAYING TIME BASE	DELAYED TIME BASE
Range	50nSec–1Sec/div	50nSec–0.2Sec/div	40nSec–2Sec/cm
Calibration	23 steps & 5–1 vernier	21 steps	22 steps & 5–1 vernier
Magnification	x1 & x10 (5nSec/div sweep)		x1 to x5 calibrated
Trigger Facilities	Int | Chan 1 | + | AC | Auto | Slow | TV Ext | Chan 2 | – | DC | Select | Fast | Line	Int | + | Chan 1 | Level Ext | – | Chan 2 | Select	Int | Chan 1 | + | Auto | Norm | Fast Ext | Chan 2 | – | Select | TV/LF | AC Line
Trigger Range	DC to >100MHz	DC to 100MHz	10Hz to >30MHz auto trigger DC to >30MHz level select
Single Shot	Yes		Yes
Horizontal Amp.	Identical X-Y operation from 5mV to 20V/div	DC to 2.0MHz-3db	DC to 1MHz 5mV–20V/cm
X-Y Phase Shift	2° DC to 500kHz at identical sensitivities		2° DC to 500kHz
Cal Accuracy	>3% Vertical amplifier and time base at x1 magnification >5% Ch 1 at x5 gain and time base at x10 magnification		3% Amplifier and time base
Cal Signal	1V p-p rectangular waveform 1% accuracy. Approx 1kHz frequency		1% Accuracy 1V p-p line frequency
Auxiliary Outputs	Displayed time base, Main time base gate, Delayed time base gate and Chan. 1 vertical signal		Time base & gating waveform
Power	AC 98 to 135V & 195 to 270V, 48 to 440Hz 50W max. DC 20 to 30V 1.5 Amps max.		95-135 & 195-265V, 45 to 440 Hz 30W
Dimensions & weight	320 x 165 x 430mm 9.3kg Net Battery pack 5.5kg Net.		320 x 170 x 430mm 8.3kg Net
Options	Rechargeable battery pack type BWD BP3 (charger incorporated) P7 CRT.		DC power supply & battery pack
Accessories	See page 6		See page 6
	DC-100MHz		DC-20MHz

Oscilloscopes

variable persistance storage



845 *new*

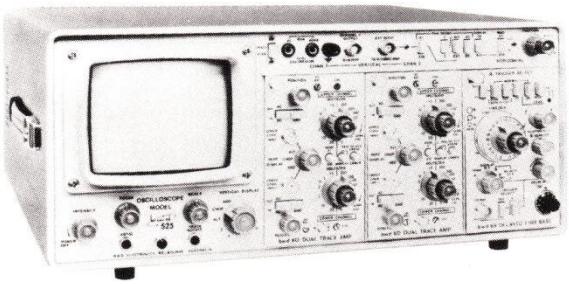
Model BWD845 is a high performance portable, variable persistence storage oscilloscope.
It incorporates delayed and mixed sweeps and can be powered by AC, DC or by an optional rechargeable battery pack.
Variable persistence — Storage enables intermittent signals to be viewed that cannot be seen on a normal oscilloscope. It also retains very slow speed signals. Fast signals at low repetition rates can be integrated to make them readily visible. This technique makes it possible to view signals that are faster than the writing rate of the oscilloscope.

Two special features have been incorporated to simplify storage operation.
AUTO ERASE: This provides a continuous erase, write and view cycle. View time is approx 4 sec after writing is completed it is then erased and waits until triggered for the next sweep.
AUTO STORE eliminates the problem of the CRT fading green whilst waiting for a trigger pulse over a long period. The screen remains in the erase mode until the trace is triggered. Immediately the trace is written it is switched to store, it may be then viewed when required.

Storage Characteristics	Writing speed (FAST >1cm/μ Sec. (NORM >1cm/10μ Sec. Viewing time: (Up to 50 min when switched to NORM after Storage time: (writing and depending on background level Variable Persistence: Decay time 1 Sec to approx. 60 Sec to 10% initial brightness. Erase: Manual 800mSec. Automatically resets SS trigger in all modes. Auto Erase Cycle: Erase, write, view (preset approx 4 seconds). Auto Store: Continuous erase cycle until T.B. triggered. Display switched to store after trace is written. Store time 30 min NORM 3 min FAST. Extended store time (non-view) up to 3 hours.
CRT	Variable persistence storage
EHT	7.5kV EHT Burn resistant
Display	8 x 10 div 1 div = 9.5mm Internal illuminated graticule
Z Modulation	Input 4.7kΩ & 10pF 0 to +2V will blank trace. DC–10MHz
VERTICAL AMP.	Both Channels
Bandwidth	DC to 30MHz–3db / DC to 25MHz–3db
Sensitivity	5mV to 20V/div / 1mV to 4V/div (x5 gain)
Rise Time	<10nSec (5mV–20V) / <14nSec (x5 gain)
Input	1MΩ & 30pF
CMRR	>20db DC to 20MHz with vernier adjusted for optimum rejection (single channel)
Attenuator	1, 2, 5, 10 sequence & vernier
Display Modes	Channel 1, Channel 2, Alternate, chopped (300kHz) or Channel 1 & 2 add or subtract
Common Line	Grounded
TIME BASE	
Function	MAIN (A) OR DELAYING TIME BASE / DELAYED (B) TIME BASE
Range	100nSec–2Sec/div / 100nSec–0.5Sec/div
Calibration	23 steps + 5 to 1 vernier / 21 steps + vernier
Magnification	x1 & x5 (20nSec/div max.) / x1 & x5
Trigger Facilities	Ch 1, Ch 2, mixed AC | Slow | Auto / Ch 1, Ch 2, Ext x1 & x10 Ext x1 & x10 DC | Fast | Select / DC Coupled
Trigger Range	DC to 30MHz / DC to 30MHz
Single Shot	Yes
Horizontal Amp.	Identical X-Y Operation DC to 1MHz–3db from 1mV to 20V/div
X-Y Phase Shift	>2°DC to 100kHz at equal sensitivities
Cal. Accuracy	>3% Amplifiers & time base at x1 gain or magnification >5% Amplifiers & time base at x5 gain or magnification
Cal. Signal	1V p-p rectangular waveform 1% accuracy. Approx 1kHz frequency
Auxiliary Outputs	A & B time base gate waveforms
Power	AC 98 to 135V & 195V to 270V 48 to 440Hz 45W max. DC 20 to 30V, 1.3 Amps max.
Dimensions & weight	320mm x 165mm x 430mm 9.5kg Net. Battery Pack 5.5kg Net.
Options	Rechargeable Battery Pack type BWD BP3 (charger incorporated)
Accessories	See page 6.

DC-30MHz

plug-in



525 & SERIES 6 PLUG-INS

(6625-66-062-0476) (6625-66-062-0471)

The BWD525 and 6 Series Plug-Ins offer performance and versatility at a very economical cost. Independent vertical amplifier channels enable different amplifiers to be fitted to each. This provides from 1 to 4 trace operation, single ended or differential inputs and amplifier sensitivities from 10μV to 50V/div. Two 6D's provide the exceptional flexibility of 4 traces of 5mV at 50MHz or two at 5mV and 50MHz plus two at 500μV and 25MHz or two differential channels of 5mV at 50MHz. The 6S time base offers a wide range of facilities with non-delayed sweep, mixed sweep, delayed sweep or delayed trigger. Trigger range extends to >70MHz and includes TV, SS, and line lock. Delayed trigger has separate polarity and level select controls.
Other features include Phase corrected identical X-Y, DC coupled Z mod., Chan. 1 output signal and a universal cabinet for portable use, bench or rack mounting.

8 x 10cm rectangular, internal illuminated graticule. P31 or P7 phosphor
10kV

8 x 10cm full deflection each channel

Input 4.7kΩ
0 to +2V for full modulation DC to >10MHz

6A AMPLIFIER	6B AMPLIFIER	6C AMPLIFIER	6D DUAL TRACE AMPLIFIER	
DC-40MHz	DC-50MHz	DC-1MHz	DC-50MHz	DC-25MHz
1mV-20V/cm	5mV-20V/cm	10μV-20V/cm	5mV-20V/cm	500μV-2V/cm
9nSec	7nSec		7nSec	14nSec at x 10 gain
Differential		Differential		
1MΩ & 25pF	1MΩ & 27pF	1MΩ & 30pF	1MΩ & 30pF	
>1,000–1		>100,000–1		
1, 2, 5, 10 & vernier	1, 2, 5, 10 & vernier	1, 2, 5, 10 & vernier	1, 2, 5, 10 & vernier (2 x 6D = 4 Channels)	

Beam switching – Alternate, chopped (500kHz) Chan. 1 or 2 only
Chan. 1 & 2 add or subtract

6A, 6B, 6C and 6D Grounded

6S (6625-66-062-0474)
MAIN OR DELAYING T.B.
100nSec–2Sec/cm
23 steps & 5–1 vernier
x1 & x10 (10nSec/cm sweep)
Int | Chan 1 | + | AC | Auto | Slow | TV
Ext | Chan 2 | – | DC | Select | Fast | Line
DC to >70MHz

DELAYED T.B.
100nSec–0.5Sec
21 steps
Int | + | AC | Level
Ext | – | DC | Select
DC to >50MHz

6T
NON-DELAYED
Specification as for 6S main T.B.

Yes Yes

6A, B & D, DC to 2.5MHz
2° phase shift DC to 1MHz

6C, DC to 1MHz
1° DC to 100kHz

Main frame DC–5MHz
500mV & 5V/cm

3% Amplifiers and time base
1% Amplitude and frequency 1kHz square wave 4V, 40mV or 4mA

Channel 1 output 0.1V/cm of deflection. Sweep and gate outputs.

90–135V & 190–265V 48–440Hz 60 watts

420 x 180 x 400mm 12kg Net

P7 CRT. Rack adaptors
See page 6. 6Z Blank plug-in available for single amplifier use.

DC-50MHz

dual trace

539D *new*

BWD539D. A versatile dual trace instrument with a 25MHz bandwidth at 5mV/cm and a cascade facility which increases sensitivity to 500μV/cm. Measurement capability extends to well beyond 30MHz and is matched by a time base that triggers to >30MHz. It also incorporates phase corrected identical X-Y operation, TV line and frame, signal output, and a high brightness CRT operating at 3.3kV. If your applications include colour TV, CB radio, video or audio recording, μ Processors and digital circuits this is an excellent instrument for your needs.

13cm dia. P31 or P7 phosphor
3.3kV

8 x 10cm. Full coverage by both traces

Input 0.01μF into 200kΩ
20V p-p for full modulation

DC to 20MHz–3db (6cm ref) 12Hz–
DC to 25MHz–3db (4cm ref) 100kHz
5mV/cm-20V/cm 0.5mV/cm
16nSec (14nSec for 4cm) single channel

1MΩ & 35pF

1, 2, 5, 10 sequence

Alternate, chopped (150kHz)
or Channel 1 only

Grounded

100nSec–2.0Sec/cm
21 steps & 5–1 vernier
x1 & x5 calibrated
Int | Chan A | + | Auto | Norm
Ext | Chan B | – | Select | TV
3Hz to >30MHz

Yes

DC to 2MHz 5mV to 20V/cm
Identical X-Y operation
2°DC to 200kHz

5% Amplifier and time base
1% Accuracy 1V p-p line freq.

T.B. output 0 to 25V approx.
Vertical signal out. 100mV/cm

90–135 & 190–265V 50–60Hz 20W

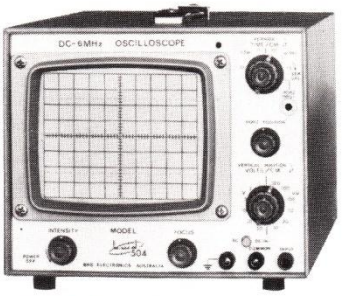
190 x 250 x 420mm 7.1kg Net

P7 CRT

See page 6

DC-25MHz

single channel isolated



504

An exciting low cost model featuring a DC to 6MHz bandwidth, 10mV to 50V/cm sensitivity, and a remarkable 5Hz to 15MHz automatic trigger for the 0.5μSec to 0.1Sec/cm time base. X-Y operation is within 3° from DC to 50kHz, CRT is a large 8 x 10cm with 1.6kV EHT. It weighs only 5.4kg and is excellent for education, servicing, production or the experimenter.

13cm dia. P31 or P7 phosphor
1.6kV

8 x 10 cm

None

DC to 6MHz–3db (–6db ≈ 10MHz)
10mV/cm-50V/cm
55nSec

1MΩ & 30pF

1, 2, 5, 10 sequence

Isolated to ±400V DC

0.5μSec–0.1Sec/cm
6 decades & 12–1 vernier
x1 only
Internal | Auto

5Hz to 15MHz

No

DC to 1MHz–3db 500mV–50V/cm
<3°DC to 50kHz

<5% Amplifier and time base

P7 CRT

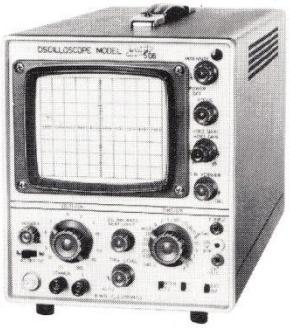
See page 6.

DC-6MHz

Discontinued Refer BWD 504 DC to 10 MHz

Oscilloscopes

single beam



506

(6625-66-045-3479)

DC to 15MHz bandwidth at 5mV/cm, a wide range sweep from 40nSec to 10Sec/cm, very stable triggering to >15MHz and an active TV sync circuit makes the BWD506 incomparable for laboratory or service use. The sync separator will lock TV waveforms buried in noise and additionally locks to AM signals. To complete the versatility the input has an isolated ground for 'in circuit' measurements to ±400V from ground.

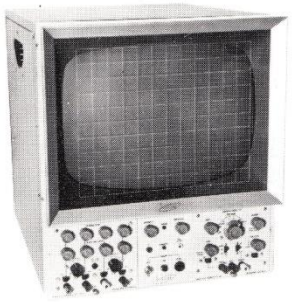
single beam

509B

(6625-66-ACN-0082)

One of the finest low cost solid state oscilloscopes available for education, production or servicing applications. It features a large 8 x 10cm bright crisp display 10mV sensitivity and DC to 10MHz bandwidth. A time base range from 200nSec to 15Sec/cm and superb triggering from <5Hz to 10MHz. X-Y phase shift is only 1° from DC to 100kHz and calibration is maintained with 5% over a line change of 10% or 10–40°C temp change. With direct reading controls and virtually automatic operation it is the choice of technicians and students around the world.

large screen display



1722
& 17 SERIES PLUG-INS

(6625-66-028-2836 1722D/17A/17E)
(6625-66-035-1359 1722B Main Frame)

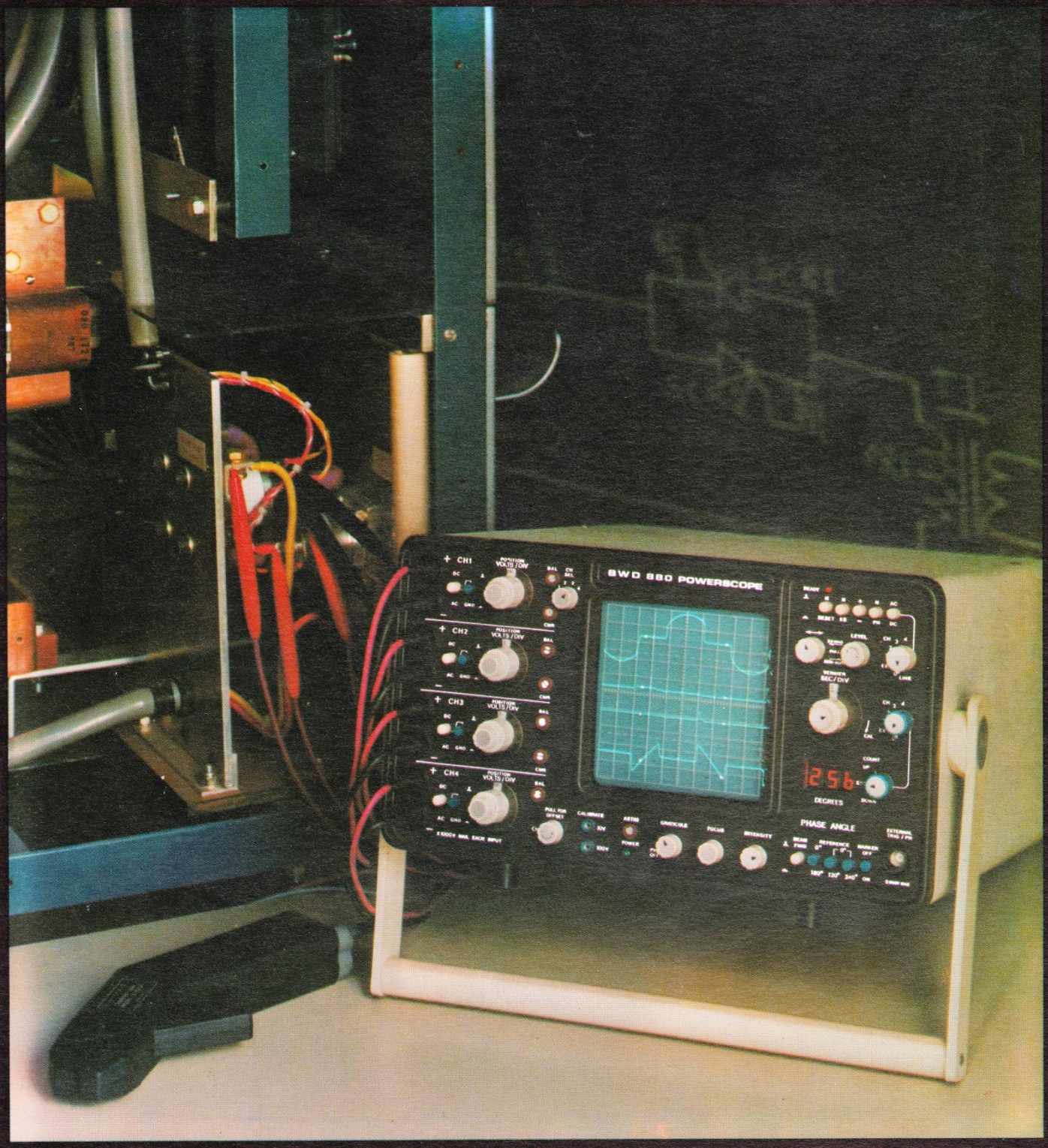
A large screen (432mm) oscilloscope widely employed for viewing computer outputs, electro-medical displays, for classroom demonstrations and servo waveform measurements.
It features three cabinet arrangements with front or rear controls. Interchangeable X & Y plug-ins, with choice of 1 to 4 channels, a high gain differential amplifier and a calibrated triggered time base. Circuitry is silicon solid state for maximum reliability, stability and low power consumption.

	506	509B	1722 & 17 SERIES PLUG-INS
CRT	13cm dia. P31 or P7 phosphor	13cm dia. P31 or P7 phosphor	432mm (diagonal) rectangular. P4, P7Y, or P26 phosphor 10 x 12 div coverage by all plug-in amplifiers
EHT	3kV	1.5kV	8kV
Display Area	8 x 10cm	8 x 10cm	10 x 12 div Full screen coverage 1 div = 25mm
Z Modulation	Input 0.01μF into 200kΩ 20V p-p for full modulation	Input 0.01μF into 200kΩ 20V p-p for full modulation	Input 47kΩ DC coupled 0 to +50V for complete blanking
VERTICAL AMPLIFIER			(6625-031-9077) 17A / 17B/2 / 17D
Bandwidth	DC to 15MHz	DC to 10MHz	DC–15kHz / DC–15kHz / DC–15kHz
Sensitivity	5mV to 100V/cm	10mV to 50V/cm	25mV–50V/div / 30mV–50V/div / 50μV–20V/div
Rise Time	23 nanoSec	35 nanoSec	30μSec / 30μSec / 30μSec
Input	1MΩ & 35pF	1MΩ & 40pF	Balanced 1MΩ / 1MΩ / Differential 1MΩ each side
Attenuator	1, 2, 5, 10 sequence & vernier	1, 2, 5, 10 sequence	1, 5, 20 & vernier / vernier / 1, 2, 5, 10 & vernier
Display Modes	Single beam	Single beam	Beam switching – alternate or chopped (5kHz)
Common Line	Isolated ±400V DC	Grounded	Grounded
TIME BASE			17E
Range	50nSec to 2Sec/cm	200nSec to 1Sec/cm	10μSec–5Sec/div
Calibration	22 steps & 5–1 vernier	6 decades & vernier	1, 5, 20 & vernier
Magnification	x1 & x5 calibrated	x1 to x5 calibrated	x1 to x5 calibrated
Trigger Facilities	Auto | + | Int | Norm Select | – | Ext | TV sync	Auto | + | Int Select | – | Ext	Auto | Int | Norm | + Select | Ext | Slow | – Preset | Line | Fast
Trigger Range	2Hz to 15MHz auto trigger	<5Hz to 10MHz auto trigger	DC to 25kHz
Horizontal Amplifier	DC to >1MHz 0.75V to >6V/cm	DC to 1MHz-3db 600mV to 6.5V/cm	DC to 10kHz (8 div deflection) 20mV to 50V/div
X-Y Phase Shift	1°DC to 100kHz	1°DC to 100kHz	
Calibration Accuracy	<5% Amplifier and time base	<5% Amplifier and time base	10% Amplifiers and time base
Calibration Signal	Line freq. Square waves 2% accuracy	Line frequency sine wave	2% Accuracy line frequency square wave
Auxiliary Outputs	Time base output 25V p-p		
Power	85–135 & 190–265V 50–60Hz 30W	85–135 & 190–265V 50–60Hz 30W	100–130V & 200–265V 50–60Hz 100 Watts
Dimensions & Weight	190 x 240 x 420mm 7.1kg Net	190 x 240 x 420mm 7.1kg Net	425 x 490 x 510mm 27kg Net
Options	P7 CRT	BNC input socket & P7 CRT	P7Y & P26 CRT
Accessories	See page 6	See page 6	See page 6
	DC-15MHz	DC-10MHz	DC-15kHz

BWD

A new Oscilloscope Concept

880 POWERSCOPE



BWD Oscilloscopes made to measure

Specification 880 POWERSCOPE

POWERSCOPE is a new class of oscilloscope dedicated to measurement in the field of Electrical Engineering and Power Control. POWERSCOPE removes the frustrating limitations of conventional measurement technology by its ability to provide precise visual display of waveforms associated with AC and DC power engineering easily and with a very high degree of operator safety.

POWERSCOPE Summary

4 Channels, differential input.
350V rms common mode rejection.
50nSec rise time.
100mV/div. maximum sensitivity to 200V/div. without divider probes.

Digital phase measurement from 0° to 359° in 1° steps.
0°, 60°, 120°, 180°, 240°, & 300° reference.

100nSec to 10Sec/div. time base range.
Digital phase trigger delay.

AC, DC or Battery operation.
10 x 10cm CRT, 6kV EHT.
Nett weight 12.5kg.

Completely insulated controls and panel for hazard free operation. Manufactured to IEC 348 recommendations.

Excellent performance as a general purpose oscilloscope with 4 channel differential input. DC to 7.5MHz amplifiers. Comprehensive time base and trigger facilities including identical X-Y operation and TTL compatible Z modulation.

To enable the POWERSCOPE waveforms to be STORED or RECORDED the combined 4 channel display plus each individual channel is brought out to rear panel sockets for connection to any storage oscilloscope.

POWERSCOPE Capability

Display 4 simultaneous, independent waveforms with signal levels up to 660V rms (±1000V) without external divider probes.

Measure differentially signal levels down to 100mV p-p in 600V rms 2 or 3 phase supplies or 350V rms single phase supplies.

Measure turn on and off times up to 50nSec of fast switching or commutating circuits. Provide ±140V of input voltage offset on one channel for detailed analysis of large amplitude waveforms.

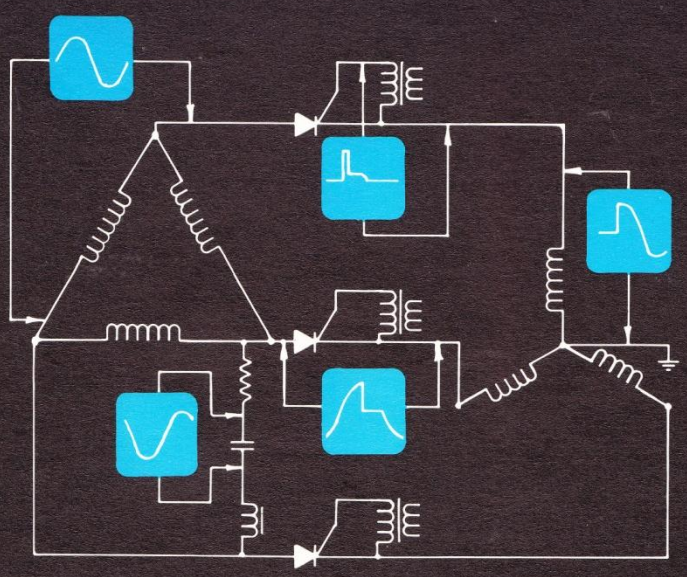
Display and measure phase of displayed waveforms from 25Hz to over 2000Hz from 0° to 359°.

Provide trigger or phase signals from any amplifiers channel, external or line (via precision zero cross over detector).

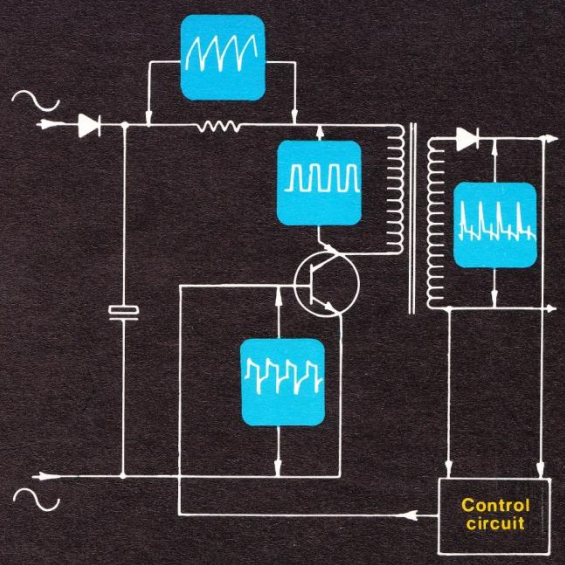
Operate from single or 2 phase AC supplies. DC or a rechargeable battery pack—the battery charger is built in. Complete portability for field servicing.

Australian and Foreign patents pending.

Typical Applications in AC and DC Power Lines



Multiphase measurements of supply voltages up to 660V rms between phases



DC supply voltages up to ±1000V.

Amplifiers

Channels: Four (Ch. 1, 2, 3 & 4).

Modes: Alternate or Chopped at 500kHz (2μSec segment).

Display: Switch selection of Ch. 1 only, 1 & 2, 1, 2 & 3 or 1, 2, 3 & 4.

Bandwidth: DC or 5Hz (AC coupled) to 7.5 MHz—3dB (6 div. ref).

Rise Time: 50nSec over 8 Div. defl.

Sensitivity: 100mV to 200V/div. 11 steps 1, 2, 5 sequence.

Calibration: <5%.

Input: 1MΩ and 9pF each side, to ground of differential input.

Max. Input: ±1000V or 660V rms. 3kV peak overload for 1 second.

Common Mode Rejection: >20,000:1 at maximum sensitivity. Panel preset to optimise CMR.

Max. Common Mode Input:
350V rms (±500V). 0.1 to 10V/div.
600V rms 20 to 200V/div.
At 0.1V/div. 250V rms appears as <4mm deflection and <1mm at 0.5V/div. or greater.

Input Offset: Ch. 4 only. Variable over ±140V for increased resolution of high voltage waveforms.

X-Y Operation: Single channel identical sensitivity X-Y display. DC to 500kHz-3dB. <3° phase shift DC to 30kHz.

Phase Generator

Range: Selectable in 1° steps from 0° to 359° by a 5 position switch providing up-down counting at 2° or 60° per second with centre stop position.

Readout: In degrees on a 10mm 3 digit LED display.

Frequency Range: 25Hz to >2000Hz. Operation is automatic with a response time of <0.5 Sec. for a 10% frequency change.

Outputs: (available simultaneously):
(i) 1° wide bright-up degree marker and 'winking' ref. marker on CRT display.
(ii) Trigger pulse for time base.
(iii) 6V pulse at rear panel socket.

0° Reference: Push button selection at 60° intervals from 0° to 300° with respect to zero cross-over point of selected source. Reference point is displayed by a 'winking' marker.

Marker Pulse Jitter: <0.5° with 0° or 180° reference. <1° with 120° or 240° reference.

Marker Pulse Accuracy: <1° from 40Hz to 400Hz increasing to <2° from 25Hz to 1kHz and <5° at 2kHz. Internal only. External input 40Hz to 60Hz <1°.

Source: Ch. 1, 2, 3 or 4, external or via zero cross-over detector from oscilloscope input power line.

Phase Resolution: <0.5° between similar pulses in 2 or 3 phase circuits.

Time Base

Range: 0.5μSec to 2Sec/div. in 21 steps at 1, 2, 5 sequence. A vernier control covers the range between steps and extends range to >10Sec/div.

Magnification: x1 & x5
Maximum sweep speed 100nSec/div.

Calibration: <3% at x1 and <5% at x5 mag.

Trigger:

Source, Ch. 1, 2, 3 or 4, external, AC line or zero cross-over detector.

Coupling, DC or AC.

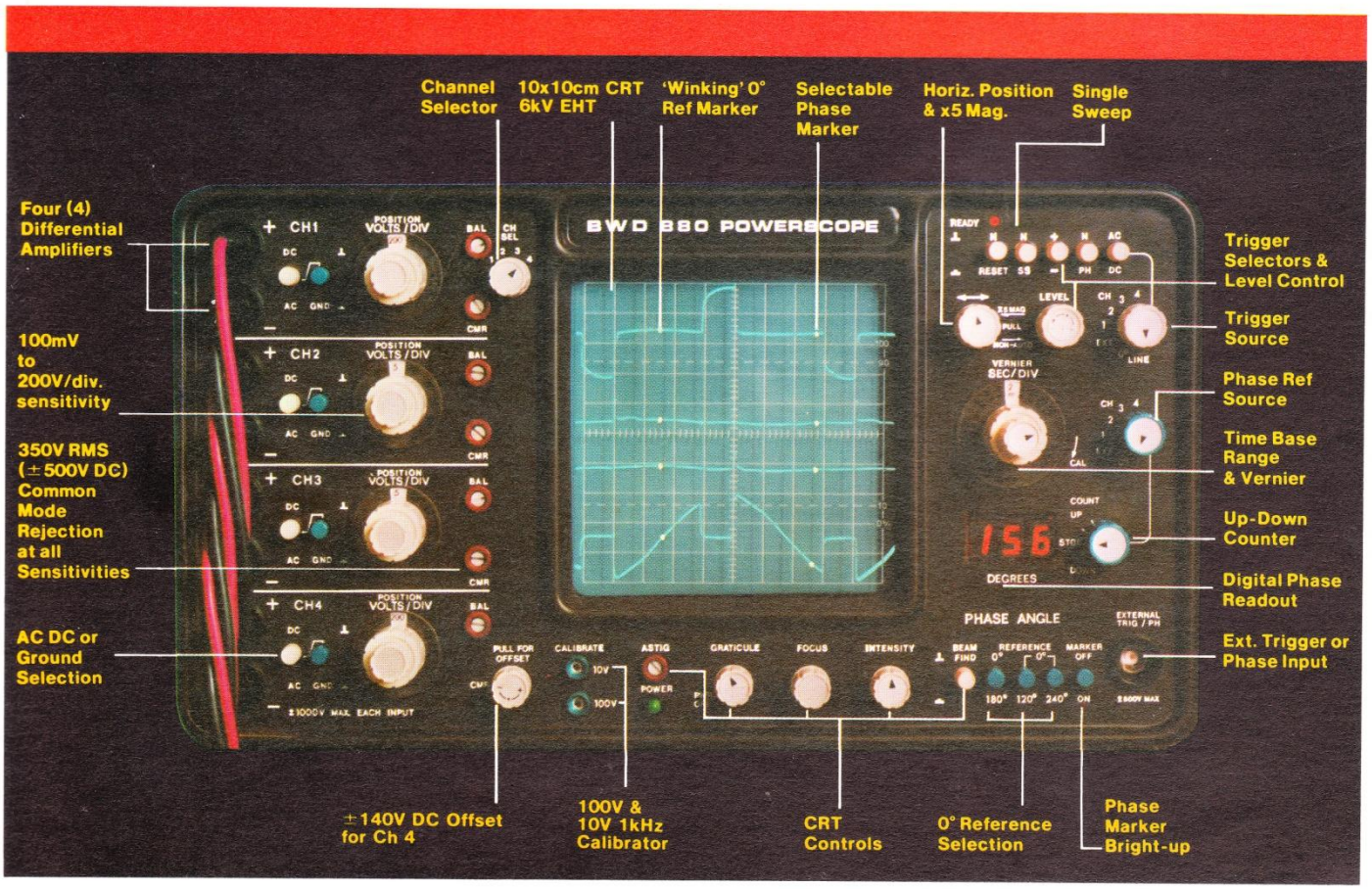
Polarity: ± with level selector over 8 div. internal, or 50V p-p external with 1:1 probe or 500V p-p with 10:1 probe.

Modes, Auto, Level Select and Single Sweep with manual or triggered initiation. Ready lamp indicates state of trigger under all conditions.

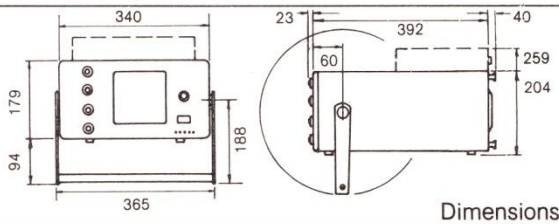
Sensitivity:
Int: 1 div. or greater 10Hz to 7.5 MHz } AC coupled
Ext: 3V p-p or greater 10 Hz to 7.5 MHz } AC coupled
Int: 1 div. or greater DC to 400 Hz } DC coupled
Ext: 3V p-p or greater DC to 400 Hz } DC coupled

Delay Trigger: Phase pulse provides trigger delay in 1° steps from 0° to 359° with digital readout.
External Input: 1MΩ & 10pF.

Maximum Input: ±1000V DC or 660V rms up to 1 kHz decreasing to 200V rms at 1MHz.



880 POWERSCOPE General Details

Input Sockets: (Front panel)	Special snap fit shrouded, high voltage. Adaptors (BWD A8) will accommodate standard BNC connectors for all input sockets.
Output signals:	Each individual channel 50mV p-p/div deflection. BNC jack. Combined signals as displayed on CRT 40mV p-p/div deflection. BNC jack. Phase pulse: coincident with up marker, width 1°. Amplitude +6V falling to 0V, 10kΩ source. Calibrator: 1kHz (approx.) rectangular wave +10V and +100V with respect to ground. Accuracy 2% at 10V, 3% at 100V into a >1MΩ load (+5°C to +40°C). Time Base Gate: +4V falling to 0V for duration of trace. 10kΩ source impedance.
Z Modulation:	+5V with respect to ground will blank trace at normal intensity. Bandwidth: DC to >10 MHz. Input 10kΩ. Maximum input ±50V.
Beam Finder:	Push button returns trace to within limits of CRT screen and over-rides intensity control.
CRT:	Square 10 x 10 div. (1 div.=1cm) operating at 6kV EHT. Variable edge illuminated graticule and blue filter. Normally supplied with P2 phosphor. P7 available as option/04.
Power Requirements:	AC, 98 to 135 Volt and 195 to 270 Volt. Selection by switch. 40 to 2000Hz 50 watts max. AC, 340V to 610V 2 phase, 48 to 400Hz available as an adaptor BWD A9. DC, 20 to 30 Volt at 1.5 amps. Battery pack BWD BP8 (optional) 3 hours per recharge. Battery charger incorporated in standard instrument. Recharging from AC or 32 Volt DC.
Low Voltage Indicator:	When the voltage supply to the oscilloscope (AC, DC or battery) falls below correct operating level the front panel indicator changes from a steady to a flashing mode.
Safety Standards:	Instrument closely conforms to IEC 348. In addition the entire operating section, controls, panel, etc., are insulated and front panel sockets are deeply recessed.
Environmental:	Specification is met, within power supply range shown above, from +0°C to +40°C and from 0% to 80% RH unless otherwise stated. Add 2% to percentage specifications for operation 40°C to 50°C 80% to 90% RH. Storage—20°C to +70°C and 0% to 90% RH.
Finish:	Dark brown moulded front panel with contrasting cream and blue controls and sand coloured vinyl covered cabinet.
Dimensions and Weight: (Shown with Battery pack)	 Weight Nett: Instrument 12.5kg Battery Pack 6.5kg Packed: Instrument 16kg Battery Pack 8kg. Dimensions in mm
Warranty:	Instrument is guaranteed for a period of 12 months from date of purchase against faulty materials and workmanship.
Accessories Supplied:	4 x 1:1 type BWD P80 & 4 x 10:1 type BWD P81 probes. Instruction manual, 1 detachable power cord fitted with an IEC 6A 250V plug.
Ordering Code:	Standard instrument: BWD 880. Fitted with options: BWD 880/option number e.g. BWD 880/04 (P7 CRT).
Options:	Battery Pack BWD BP8. Two phase stepdown transformer 340-610V 48-400Hz. Adaptor BWD A9. P7 CRT. Option 04.
Optional Accessories:	1:1 Probe, 1.5 metres unscreened. Red or black, spring hook. BWD P80/R or BWD P80/B. 10:1 probe, 1.5 metre cable. 3KV peak working BWD P81. Special BNC to Standard BNC Adaptor BWD A8. Folding Viewing Hood BWD H80. Carrying Case BWD C80. Dust Cover BWD D80. Oscilloscope Trolley BWD T61 Front Panel Protective Cover BWD SC80. Cameras—Details on request.
Battery Pack:	The type BWD BP8 Battery pack is readily attached or detached from BWD 880 POWERSCOPE. It is fixed by two screws and connects via a plug to the rear panel socket. If desired the battery pack can be carried separately by means of its own handle. Recharge time of 14 hours provides approximately 3 hours running time.

Designed and Manufactured in Melbourne, Australia by:

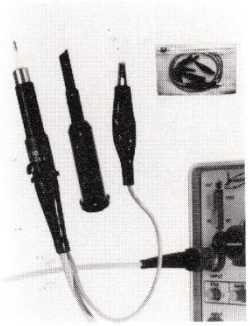
BWD Electronics Pty Ltd

Miles Street Mulgrave Victoria 3170 Australia
P.O. Box 325 Springvale Vic. 3171
National Phone (03) 561 2888
International Phone 613 561 2888
Telex 35115
Cables "Oscope" Melbourne.

Sold and Serviced by:
BWD Electronics Pty. Ltd.
and authorised national and international representatives.
With a policy of continuous development, variations in technical detail may occur.

Printed in Australia.

accessories



P32 Duo Probe

PROBES

P32. 10:1, 1:1 and 'off' position. 10MΩ & 11pF input in 10:1 position. (6625-66-088-6499)
DC to 100MHz range. Retractable hook & tips. 1.2M cable & BNC connector.
P36. 10:1 probe 10MΩ & 12pF input capacity DC to 250MHz
P37 100:1 probe 1.5kV cable working.
P30. 1:1 screened test prod. (6625-66-031-2035)
P34. Demodulator probe kit 100kHz to 200MHz-0.5db
to 300MHz-1.0db
P40. Low cost 10:1 probe. DC–80MHz. 1m cable BNC connector.
BNC to 4mm adaptor available for all probes.

TROLLEYS

T60 for instruments to 380mm wide x 610mm long.

T61 for instruments to 530mm wide x 610mm long. (6625-66-035-1361)
Range of lockable accessory drawers, sprung and brake type castors and multiple power outlets are available.

CAMERAS

Super 7 Shackman camera system with mounting bezel. This model features interchangeable film backs.

CU5 Polaroid camera complete with hood adapter to suit all BWD oscilloscopes.

CASES

Simulated leather carrying cases with aluminium frame and foam lining available for majority of BWD instruments.

Angle sections and panels available to rack mount all BWD oscilloscopes.

FRONT PANEL PROTECTIVE COVER

Suitable for models: BWD530A, 540 & 845.

VIEWING HOOD

H46. Folding type. For all BWD500 & 800 series oscilloscopes.

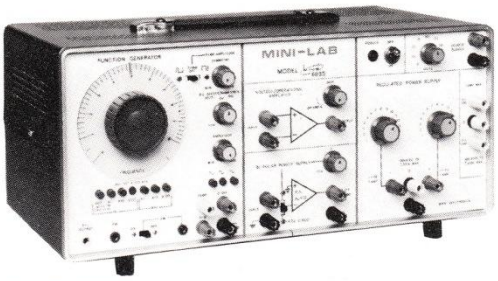
SUNDRIES

Cables, terminals and adaptors, plugs, sockets, handbooks, etc., also

DUST COVERS

Soft vinyl material.

MINI LAB



new

603B
FUNCTION GEN/AMPLIFIERS/ MULTIPLE POWER SUPPLIES

MINI LAB. A most versatile instrument which combines a 0.001Hz to 2MHz function generator with a 7W DC coupled power amplifier, an op. amp, sweep ramp generator and 3 DC power supplies. Inputs and outputs are quite independent or may be linked for a multitude of uses. The Function generator has variable ramp and pulse output, two levels of attenuation and may be swept over a 100:1 range by its internal sweep ramp generator. The Power amplifier which extends from DC to >80kHz also doubles as a 1 amp bi polar or voltage controlled power supply or as a fixed +5V 1 amp supply. A comprehensive handbook describes the wide range of applications and waveform characteristics available.

FUNCTION GENERATOR
Range: 0.01Hz to 1MHz in 8 decade ranges. Plus an additional 200kHz to 2MHz range. Uncalibrated range extends to 0.001Hz.
Output: 0–10V p-p or 0–5V into 600Ω) Simultaneous
0–1V p-p or 0–0.5V into 600Ω) outputs.
Functions: Sine, square, triangle, ramp and pulse
1:1 to 50:1 ramp or pulse mark-space ratio
TTL compatible output >3V into 2 TTL loads.
Output Offset: 0 to ±5V
Modulation: FM 1000:1 DC coupled) With external
AM 0 to 95% DC coupled) signal.
Sweep 100:1 with internal sweep.
Sweep: Linear ramp variable >5Sec to approx 50mSec. Sweeps over complete dial range down to any 10% portion of the range.

POWER AMPLIFIER
Frequency Response: DC to 80kHz-3db
Output: 30V p-p current ±1 amp p-p (constant current overload) 7 Watts into 15Ω

BI-POLAR POWER SUPPLY
Range: Continuously variable from -15V to +15V with 1 amp max. current at any voltage.

+5V POWER SUPPLY
Output: Fixed +5V. Max current 1 amp.

Alternative outputs selected by a 3 position switch

VOLTAGE/OPERATIONAL AMPLIFIER
Frequency Response: DC to 80kHz
Gain: x1 to x100 continuously variable or may be switched with O/C feedback and isolated inputs.
Input: 10kΩ each side or 0.5MΩ isolated.
Slew Rate: 4V/μSec.

DUAL POWER SUPPLY
Output: +1 to +15V and –1 to –15V about a common 0 line. May be used as + and – rails to 15V or from ±2 to ±30V as a single supply.
Current: 1 amp short circuit protected.
Line and load regulation: <1%

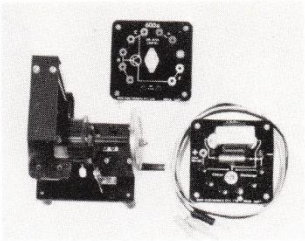
HIGH VOLTAGE SUPPLY
Output: 0–200V 30mA continuously variable
AC Output: 12.6V 1A CT (6.3–0–6.3) fused.

POWER REQUIREMENTS
95V–135V & 195–265V 50–60Hz.

DIMENSIONS 420 x 200 x 260mm
NET WEIGHT 10kg.

0.001Hz-2MHz
7W POWER OUTPUT

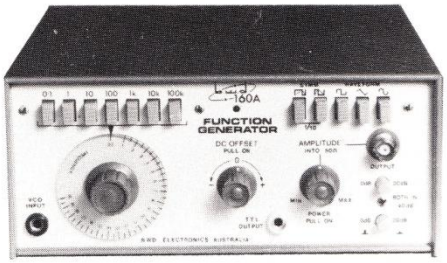
accessories

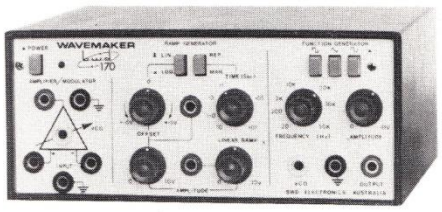


600 SERIES

600A	DC-AC 2 pole motor/ generator with commutator, slip rings and permanent magnet.
600B	Electromagnet 1m leads and 19mm square 75mm pole piece.
600C	24V lamp mounted with leads and plugs.
600D	Microphone with 1m screened lead and input plugs.
600E	Interconnecting leads, 1m long, fitted with 4mm stacking plugs.
600F	7-pin valve base on stand. Complete with 6AU6 valve.
600G	Transistor mounted on stand. Complete with 2N3054 Silicon NPN power transistor.
600H	4 silicon diodes (2 amp). Diodes type BYX21-200.
600I	300–800kHz parallel resonant circuit and detector diode.
600J	Cadmium sulphide cell with variable aperture light shield.
600K	6V buzzer mounted on stand, AC or DC operation.
600L	R.C. charging circuit TC 1 Sec.
600M	L.C. charging circuit TC 1 Sec.
600N	30Ω 100mm loud speaker on stand.
600P	C.L. & R phase and impedance circuit.
600Q	Low voltage relay with changeover contacts.
600Z	Lined wooden carrying case.

Function Generators





160A

The BWD160A is a very moderately priced generator providing 12 different waveforms and 5 simultaneous outputs. It can be swept over any section of its frequency range up to 4 decades wide by the BWD170 log or linear ramp output. Pulse or ramp outputs of either polarity have a fixed mark-space ratio of approx 20–1 thus maintaining a constant calibration at 1/10th the indicated frequency.
Sine, Square and Triangle outputs at a fixed 1V p-p level are available on the rear panel and a 20 load capacity TTL output at the front. Main output is 20V O/C with variable offset to ±10V or 10V into 50Ω.

Freq. Range:	0.02Hz to 2MHz in 7 ranges.
Freq. Dial:	1–20 with uncalibrated point at 0.2 Accuracy ±3% of full scale above 2Hz.
Waveforms:	Sine, Square, Triangle, ±Pulse, –Pulse, +Ramp & –Ramp.
Output Voltages:	1. Main Output (front panel BNC) 0–20V O/C or 0–10V p-p into 50Ω via two step 40db attenuator and 100–1 vernier. 2. Auxiliary Outputs: (rear panel) Sine, Square & Triangle or Pulse/Ramp if selected for main output. 1V p-p fixed. 1kΩ output impedance. 3. TTL 0 to +3V O/C to drive 20 loads. <50nSec rise time.
DC offset:	0 to ±10V O/C or ±5V into 50Ω
Sine Wave:	<1% distortion 10Hz–200kHz <2% 5Hz to 1MHz.
Square Wave:	100nSec rise time into 50Ω
Triangle Wave:	2% symmetry. 99% linearity 1Hz to 100kHz.
Pulse or Ramp:	1/10th indicated frequency. ±10% of full scale. + or –pulse or ramp by switch selection.
Isolated Ground:	Operation permissible up to ±200V DC from ground.
Operating Temp:	Calibration specified +10° to +35°C. 0 to 50°C specification tolerances x2
Power Requirement:	200–270V 6W 48 to 440 Hz
Dimensions:	210 x 100 x 210 mm
Weight:	1.8 kg Net
Options:	Supply 100 to 137V Output impedance 600Ω

0.02Hz to 2MHz

170 WAVEMAKER

WAVEMAKER – a unique multipurpose triple function instrument. It can operate as a self contained Function sweep generator or be used in conjunction with the BWD160A or 603B and most other signal sources.
It contains a single range Function generator covering from 20Hz to 50kHz approx. A log or linear Ramp generator with a simultaneous linear ramp for driving an oscilloscope or other display is the second circuit block. The third is a voltage controlled DC to 10MHz amplifier which will amplitude modulate, frequency double or multiply in addition to amplifying from 0 to x2.
One feature provided for the Ramp generator is a manual sweep which enables the frequency of a VCO to be measured by a counter at any point along the sweep to facilitate making an accurate scale.
Applications for the BWD170 are only limited by the ingenuity of the user.

FUNCTION GENERATOR.	
Range:	20Hz to 50kHz approx.
Waveforms:	Sine, Square or Triangle.
Output:	0–10V O/C. 0–5V into 600Ω
Output Impedance:	600Ω±10%.
VCO Input:	May be swept over entire range or any part by the ramp generator.
RAMP GENERATOR.	
Output:	Log or linear ramp. 0 to +10V with ±0.5V offset. –ve ramp via amplifier.
Ramp Duration:	10mSec to 10Sec.
Manual Sweep:	Log or linear output.
Auxiliary Outputs:	Linear ramp 0 to +10V coincident with main output. +ve & –ve 0 to +3V gating pulse.
AMPLIFIER MODULATOR.	
Amplifier:	DC to 10MHz-3db into 600Ω
Output:	±10V O/C or ±5V into 600Ω
Input:	10kΩ all inputs. ±40V p-p max.
Gain Control:	Gain is linearly controlled from 0 to x2 by a–2V to +2V input.
Amplitude Modulator:	0 to 100% modulation.
Range:	0 to 10MHz carrier or modulation.
Balanced Modulator:	0 to 100% modulation.
Range:	0 to 10MHz carrier or modulation.
Mod. Balance:	Within 10%.
Frequency Doubler:	Input 0 to 5MHz. Output 0 to 10MHz.
Multiplier:	DC to 1MHz range. DC to 100kHz for 10% accuracy.
Operating Temp:	Calibration specified +10° to +35°C. 0 to 50°C specification tolerances x2
Power Requirement:	200–270V 6W 48 to 440 Hz
Dimensions:	210 x 100 x 210 mm
Weight:	1.8 kg Net
Options:	Supply 100 to 137V

20Hz to 50kHz

Oscillators

sine & square wave

112B (6625-66-042-5147)

High output sine & square wave generator

A capacitor tuned oscillator with infinite resolution, and a high level, low distortion fully attenuable output. The simultaneously available square wave delivers a fast rise time low impedance output with attenuation down to a millivolt. Both sine and square outputs will drive into any resistive load down to a short circuit without change in characteristics.

141 (6625-66-050-4650)

Low distortion sine & square wave generator

A portable, battery or line operated sine and square wave generator providing the unusually wide range of 1Hz—1MHz. 800 hours battery life, sine wave and 400 hours square wave operation, together with small size and lightweight and remarkable low distortion typically below 0.06% from 100Hz to 100kHz make this instrument ideal for field or laboratory use.

	112B	141
Frequency Range	10Hz—1MHz (5 decade ranges)	1Hz—1MHz
Facilities	Sine and square	Sine and square
Calibration	Better than 2% + 0.5Hz	Better than 5% 10Hz—1MHz
SINE WAVE		
Output	25V RMS O/C 12.5 RMS into 600Ω	2.5V RMS into 600Ω
Attenuator	600Ω decade and vernier	600Ω decade and vernier Calibrated 0—2.5V RMS
Level	±3% over entire range	±3% over entire range
Distortion	<0.2% 100Hz to 40kHz	<0.1% from 100Hz—100kHz
Noise and Hum	<0.05%	0.01%
Output Terminals	Single ended — grounded	Single ended — isolated
Power Output	250mW into 600Ω	10mW into 600Ω
	NOTE: Oscillator will drive any output from O/C to S/C without change in level response or increase in distortion.	(Balanced output with external divider)
SQUARE WAVE		
Rise and Fall Time	200nSec into 100pF Output range 20V 150nSec into 10pF 20V 100nSec into 100pF 2V & below	100nSec into 50pF and 10kΩ load
Output	20V p-p into open circuit 2V p-p into 50Ω	2.5V p-p into 10kΩ
Attenuator	100Ω decade and vernier	600Ω decade and vernier
Output Impedance	20V 0—250Ω 2V & below 100Ω	600Ω constant below 0.2V
Power Requirements	85—135V & 190—260V 50—60Hz	2 x 276P battery or AC Power module
Size	210 x 200 x 255mm	210 x 150 x 150mm
Weight	4.3kg Net	2.5kg Net
Optional Accessories	Dust cover 19" x 7" Rack adaptors	Dust cover
Options	None	01 AC operation 03 Battery operation
	10Hz - 1MHz	1Hz - 1MHz

Video Equipment

line selector

701 & 711

Available as an integral unit fitted to BWD 540 or as a separate unit for use with any suitable oscilloscope. The selector operates on any video standard and line selection is made by a 10 turn control with digital readout. Fields are selected by push buttons. Variable trigger delay starts the trace anywhere along the selected line. Monitor output with line bright up pulse shows the exact position of the line under examination. These lines can be preset and selected by push buttons.

INPUTS: 75Ω high impedance loop through.
INPUT VOLTAGE: 0.4 to 2V p-p (25mV p-p to 100V p-p via BWD 540 amplifier).
SYSTEMS: PAL, PAL D, SECAM & NTSC.

LINE SELECTOR: 10 Turn rotary control selects any line from the selected field. Two additional lines are available by push button selection.

FIELD 'SELECTORS': Four push buttons select each field in sequence. A switch selects 4 or 2 field displays.

TRIGGER OUTPUT: 4V pulse, pos. going edge coincident with leading edge of line-sync pulse. Neg. going edge adjustable by Trigger Delay from 2μSec to >65μSec.
DC RESTORATION: Back porch or sync tip with fast or slow clamp by switch selection.
FILTER: Low pass switchable filter removes chrominance signals and colour burst from oscilloscope display.

MONITOR OUTPUT: Response flat to 6MHz within 3% with 75Ω termination.
Gain approx. 1:1 superimposed bright up pulse co-incident with selected portion of line.
VIDEO OUTPUT: Response flat 10MHz within 3% (-3db at 40MHz) Gain approx. 1:1.

SIZE: 55mm High x 210 wide x 200 deep. Weight 1 kg.
MODEL: BWD 701/540 integral unit.
BWD 711 AC powered separate unit.

ACCESSORIES: 701/540 supplied complete with cables and handbook. BWD 711 c/with power cord and handbook.

NOTE: Plug-in 6F with the above spec. is also available for BWD 525 oscilloscope.

Stabilised DC Power Supplies

high current

207B

High current 10–15 & 20–30V DC supply

Although intended primarily to supply 12V and 24V communication equipment, this highly stabilised low impedance supply incorporating foldback overload will meet a wide range of applications.

high voltage

216A (6625-66-064 -2148)

Dual output high voltage supply

Two high voltage, completely isolated, stabilised outputs, together with two unregulated 6.3V AC outputs gives Model BWD216A excellent versatility as a general purpose laboratory power supply. It has been widely adopted for use in technical, high school and medical laboratories. 0 to + 400V rail fitted with 10 turn control.

multi-range

272A (6625-66-ACN -0013)

Triple range programmable supply

Model BWD272A is a small but very high performance constant voltage-constant current supply. Features such as remote sensing, auto parallel, auto series, and remote voltage and current programming are standard and 10 turn voltage control. Crowbar overload is available as an option.

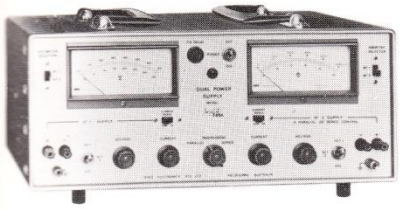
275 (6625-66-054 -2067)

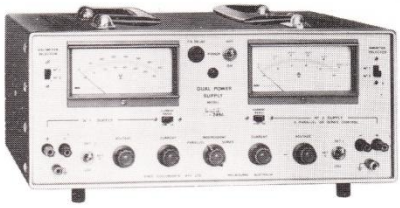
Dual range programmable supply

Model BWD275 is a very compact high performance supply providing two voltage-current ranges, full remote programming, auto series and parallel operation and remote sensing. Dual meters provide simultaneous voltage and current monitoring.
10 turn voltage control and crowbar overload is standard.

	207B	216A	272A	275
Output Voltage and Current Ranges	Two switched ranges. 10–15V at 12 amps 20–30V at 6 amps	0–400V cont. variable 0–200mA 0–250V cont. variable 0–50mA 2 x 6.3V 3 amps AC phased for series or parallel operation.	0–12.5V at 2A 0–25V at 1A 0–50V at 0.5A Voltage and current continuously adjustable over each range.	0–36V at 2A 0–72V at 1A Voltage and current continuously variable over each range.
CONSTANT VOLTAGE				
Range	Both ranges	Both ranges	All ranges	Both ranges
Line Regulation	0.1%	0.002% + 3mV	0.001% + 100μV	0.002% + 100μV
Output Impedance	5mΩ (DC–1kHz)	5mΩ (DC–1kHz)	1mΩ (DC to 1kHz) 2mΩ 0–50V	1mΩ (DC to 1kHz) 2mΩ 0–72V
Ripple	1mV RMS (5mV p-p)	1mV RMS	200μV RMS (1mV p-p)	200μV RMS (1mV p-p)
Response Time	50μSec	50μSec	40μSec	50μSec
CONSTANT CURRENT				
Range	Preset 13A (10–15V) 6.5A (20–30V)	20–200mA 60mA (preset)	0.01–2A 0.01–1A 0.01–0.5A	0.01–2A 0.01–1A
Voltage Limits	Foldback overload commences approx. 1V below set output voltage.	0–400V 0–250V	0–12V 0–25V 0–50V	0–36V 0–72V
Output Impedance	N.A. Overload protection only.	10kΩ 10kΩ	100kΩ	100kΩ 10kΩ
Current Ripple		4mA RMS 4mA RMS	100μA RMS	200μA RMS 200μA RMS
Line Regulation		0.05% + 20μA 0.05% + 20μA	0.005% + 100μA	0.005% + 100μA
Metering	0–35V and 0–15A	0–400V & 0–200mA	0–20 & 0–50V) switch 0–2 amps) selected	0–36 & 0–72) by switch 0–0.2 & 0–2 amps) selection
Power Requirements	90–137V & 190–265V 50–60Hz	90–137V & 185–265V 50–60Hz	90–137V & 185–250V 50–60Hz	90–137V & 185–250V 50–60Hz
Dimensions	290 x 255 x 305mm	210 x 200 x 310mm	210 x 200 x 285mm	210 x 200 x 305mm
Weight	153kg Net	9.5kg Net	5.6kg Net	6.6kg Net
Options	None.	Digit dial for 10 turn control. 10 turn voltage controls for 0 to 250V rail.	Digit dial for 10 turn control. 10 turn current controls. Crowbar overload.	Digit dial for 10 turn control. 10 turn current controls.
Accessories	Dust cover.	19" single/dual rack mounting adaptor. Dust cover.	19" single/dual rack mounting adaptor. Dust cover.	19" single/dual rack mounting adaptor. Dust cover.
	15V 12A 30V 6A	400V 200mA 250V 50mA	12V 2A 5CV 0.5	36V 2A 72V 1A

dual output





242A (6130-66-068-9204)

Dual output
programmable supplies

Extremely versatile dual supplies with front panel switching for series or parallel operation. Set volts, set current, use switches on each supply, remote sensing and full voltage and current programming with auto series or parallel operation facilities are combined in these models with a very high performance specification to set new standards for a laboratory supply. Incorporates 10 turn voltage controls and crowbar o/load is optional.

0–36V 2A)
0–36V 2A) Independent
or
0–36V 4A Parallel
or
0–72V 2A Series
±0–36V 2A Auto tracking

Independent
0.002% + 100μV
1mΩ(DC to 1kHz)

Parallel & Series
0.005% + 200μV
2mΩ(DC to 1kHz)

300μV RMS (4mV p-p)

60μSec 100μSec

0–4A & 0–2A
0–36V & 0–72V

Independent 100kΩ 200μA RMS 0.005% + 100μA

Parallel >10kΩ 500μA RMS

Series >10kΩ 200μRMS

0–4A 0–72V
0–0.2A 0–36V

90–137V & 185–250V 50–60Hz

420 x 200 x 270mm
16kg Net

NOTE: The following options are for each output.
Digit dial for 10 turn controls.
10 turn current controls.
Crowbar overload.
19" rack mounting adaptors.
Dust cover.

36V 2Ax2

246A (6130-66-050-7020)

Dual output
programmable supplies

Extremely versatile dual supplies with front panel switching for series or parallel operation. Set volts, set current, use switches on each supply, remote sensing and full voltage and current programming with auto series or parallel operation facilities are combined in these models with a very high performance specification to set new standards for a laboratory supply. Incorporates 10 turn voltage controls and crowbar o/load as standard.

Independent 0–36V 5A)
0–36V 5A)
or
Parallel 0–36V 10A
or
Series 0–72V 5A
Auto tracking ±0–36V 5A

Independent
0.002% + 100μV
1mΩ(DC to 1kHz)

Parallel & Series
0.005% + 200μV
2mΩ(DC to 1kHz)

300μV RMS (4mV p-p)

60μSec 100μSec

0–10A & 0–5A
0–36V & 0–73V

Independent 100kΩ 500μA RMS 0.02% + 100μA

Parallel >10kΩ 1mA RMS

Series >10kΩ 500μA RMS

0–10A 0–72V
0–0.5A 0–36V

90–137V & 185–250V 50–60Hz

420 x 200 x 270mm
22kg Net

Digit dial for 10 turn controls.
10 turn current controls.
19" rack mounting adaptors.
Dust cover.

36V 5Ax2

BWD ELECTRONICS PTY. LTD.,
REG. OFFICE & ADMINISTRATION
RESEARCH & DEVELOPMENT CENTRE
NATIONAL & EXPORT SALES
MANUFACTURING & SERVICE DIVISION.

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&
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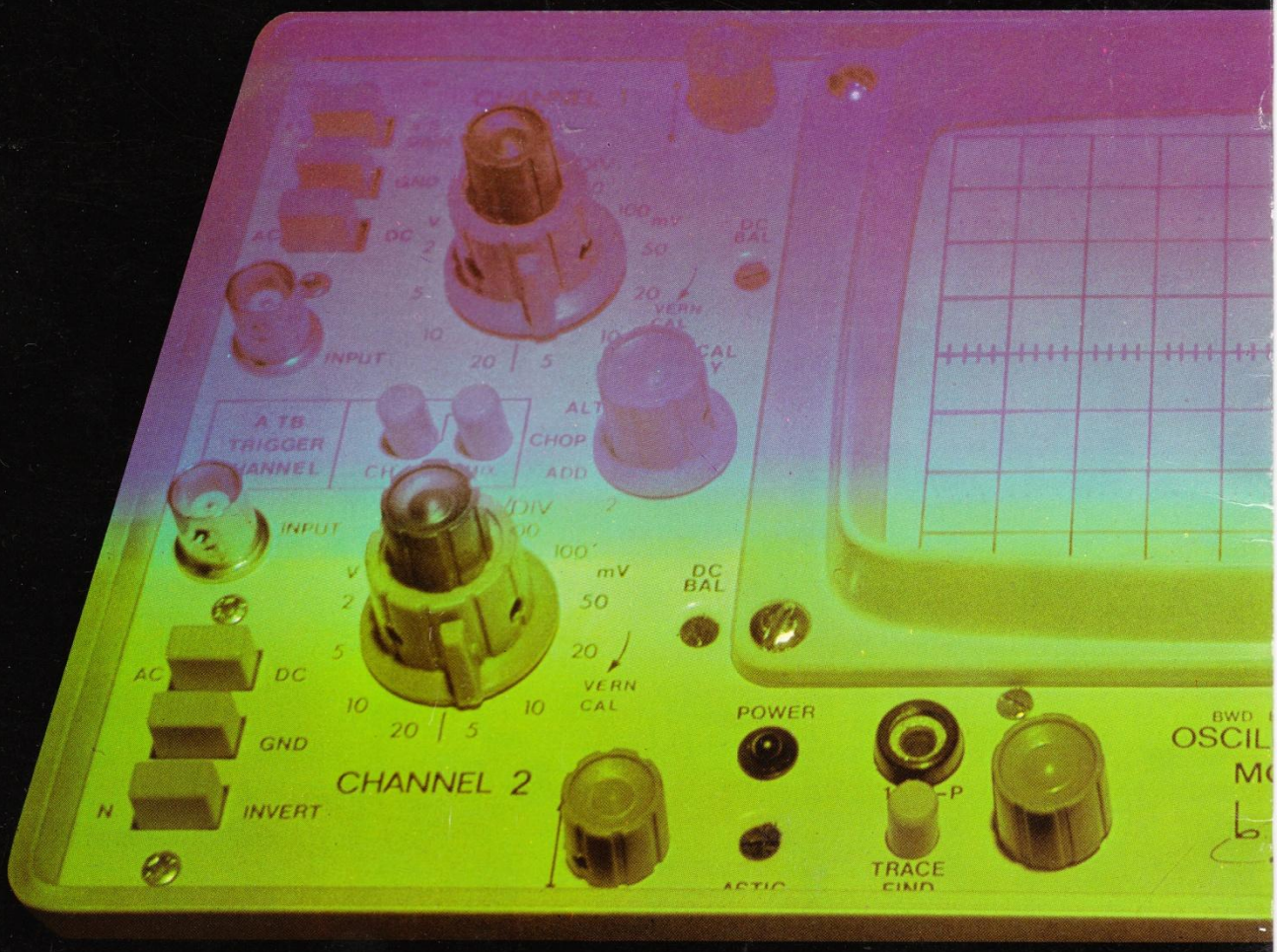
'LECTROFLUX'
NON-DESTRUCTION TESTING DIVISION

In addition to the BWD range of instrumentation, the 'Lectroflux' NDT Division manufactures and markets a wide range of magnetic particle inspection equipment, including portable hand held units up to large capacity bench units with magnetising currents up to 14,000 Amps AC & DC, employing advanced engineering concepts.

BWD


INPUT
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POWER
TRACE
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