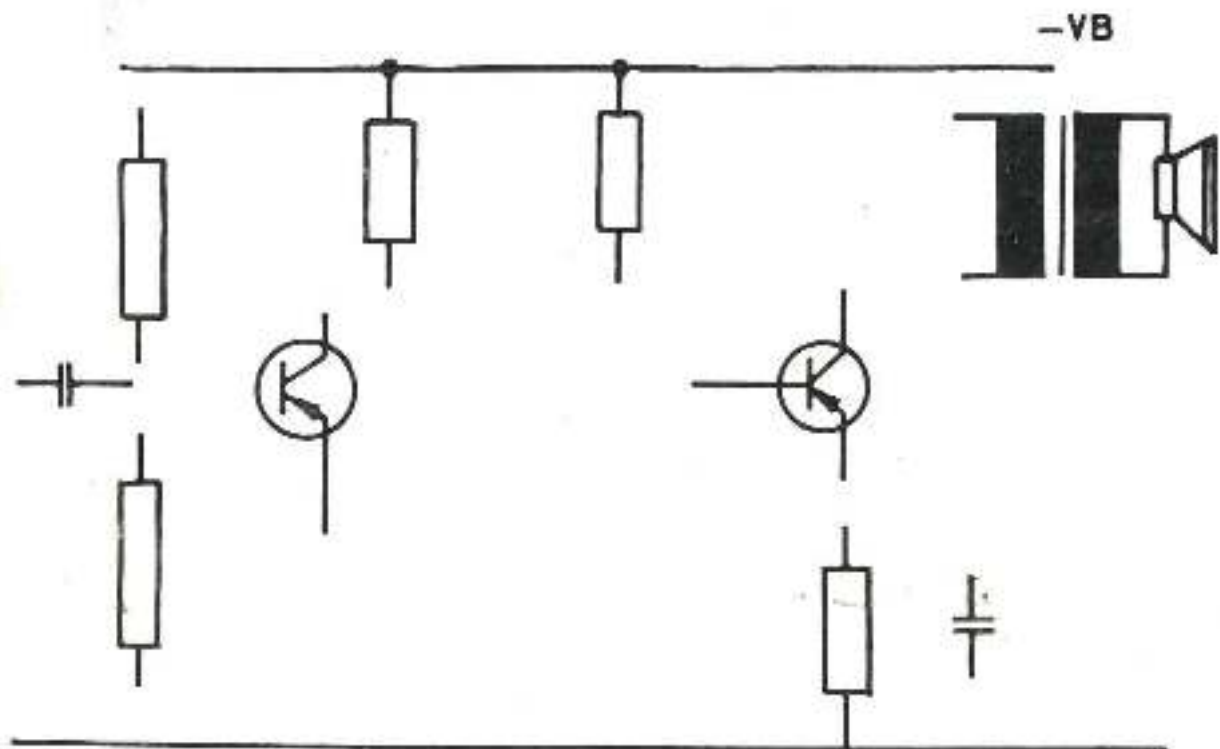


# TECHNICAL DRAWING

# 2

RADIO & TELEVISION



DEVELOPMENT CELL  
FOR SKILLED LABOUR TRAINING  
DIRECTORATE OF MANPOWER & TRAINING  
GOVERNMENT OF PUNJAB  
LAHORE

T.T.P. Series No. 89

Price : Rs. 15.00



C O N T E N T SDRAWING NO:

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<u>VALVE</u>	
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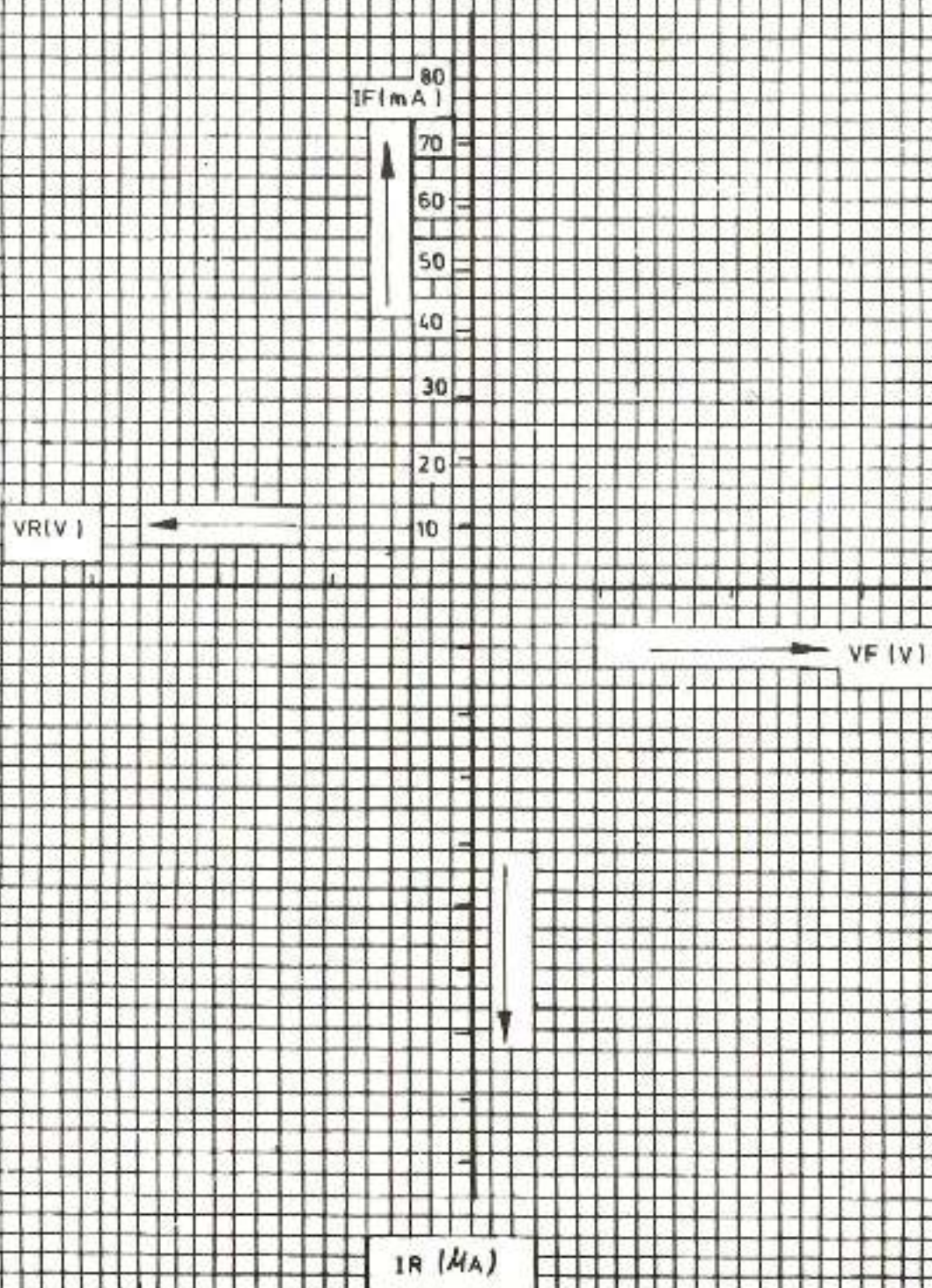
Prepared and published by:-

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING  
14/A BABAR BLOCK NEW GARDEN TOWN LAHORE-16

Printed by : Mayo Art Press

42- Lower, Mall, Lahore.

Draw the characteristic curve of germanium diode



CHARACTERISTIC CURVE  
OF GERMINIUM DIODE

TECHNICAL DRG  
NO. 46



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

DRAW STRUCTURE OF:-

- Filament
- Cathode
- Control grid
- Screen grid
- Anode

**INTERNAL STRUCTURE OF VALVE**

TECHNICAL DRG.  
NO. 47

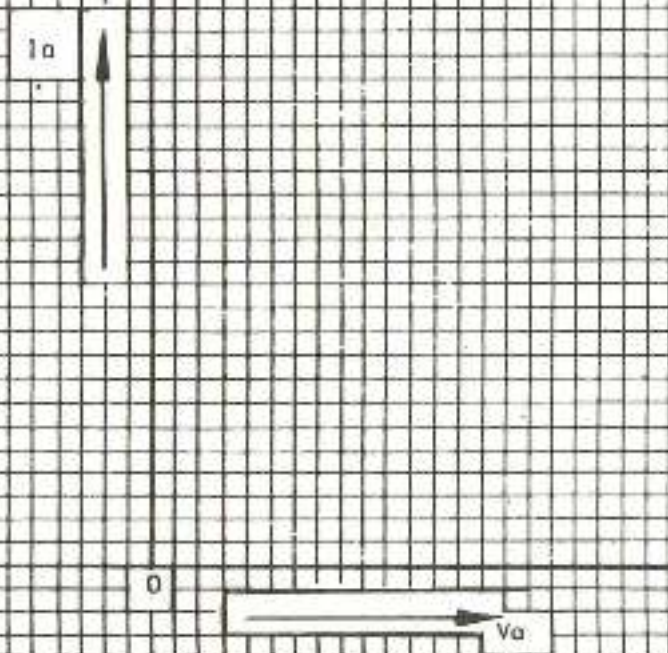


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

Draw the characteristic curve of valve diode  $I_a - V_a$



CRACTERISTIC CURVE  
OF VALVE DIODE ( $I_a - V_a$ )

TECHNICAL DRG  
NO, 48

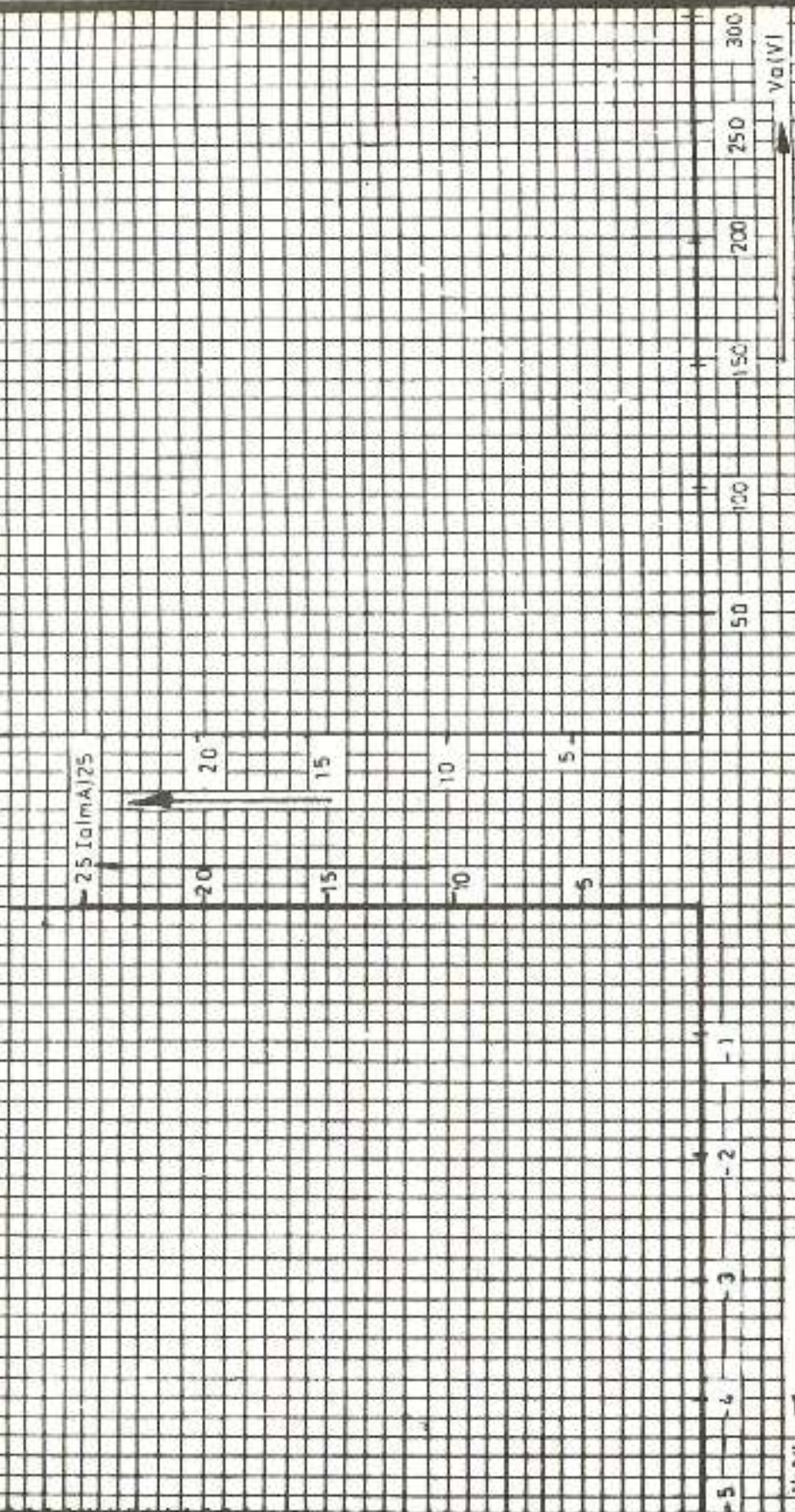


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

Draw the characteristic curve of triode



CHACTERISTIC CURVE OF TRIODE

TECHNICAL DRG  
NO. 49

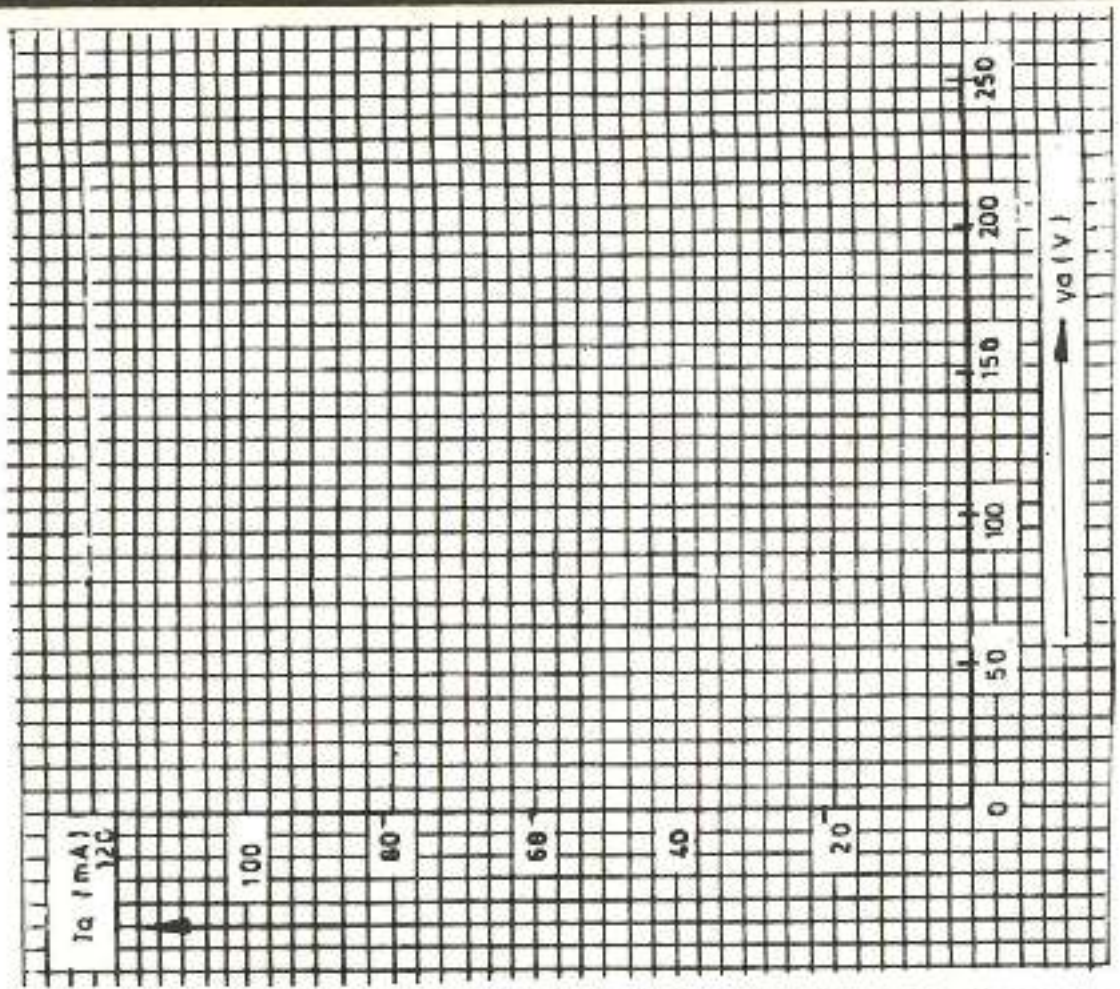
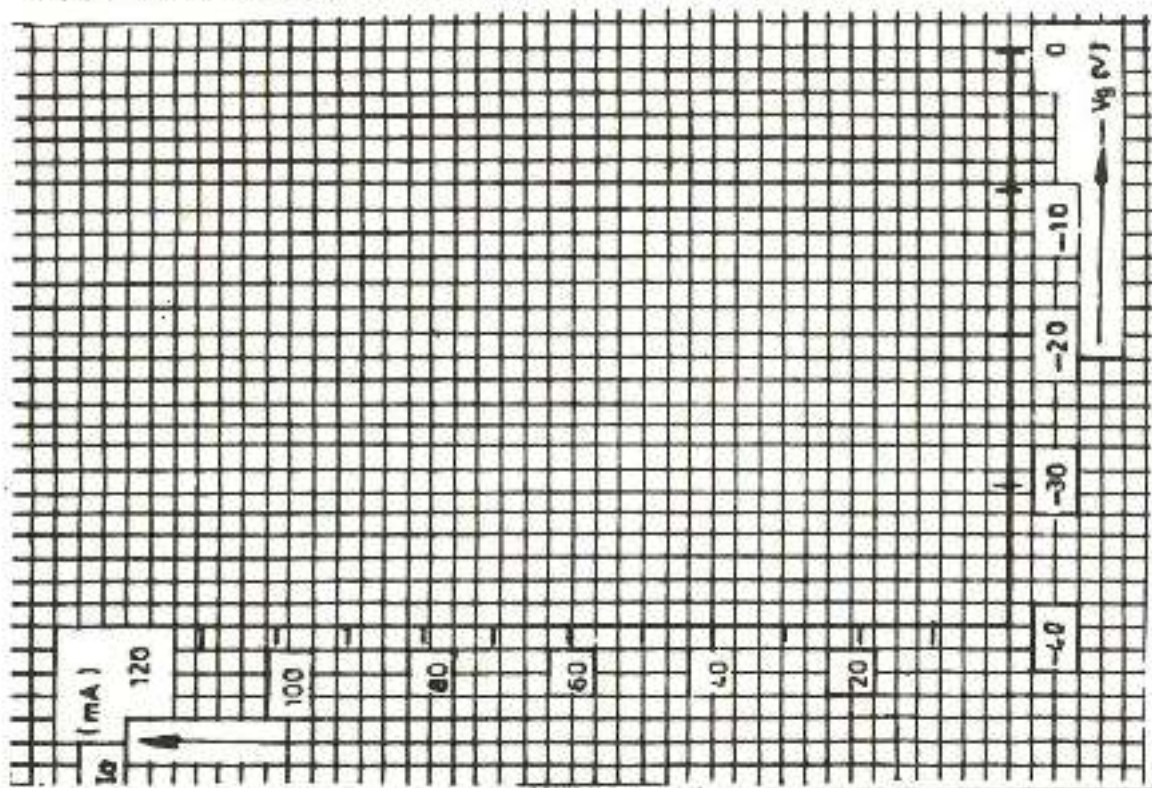


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T. V

DRAW THE CHARACTERISTIC CURVE OF PENTODE



CHARACTERISTIC CURVE OF PENTODE

TECHNICAL DRG.  
NO. 50



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

Draw wave diagram of voltage  $V_R$  /  $V_L$  /  $V_{Total}$

$V_i$

30° 60° 90° 120° 150° 180° 210° 240° 270° 300° 330° 360°

WAVE DIAGRAM OF VOLTAGE  
 $V_R$  /  $V_L$  &  $V_{TOTAL}$

TECHNICAL DRG  
NO. 51



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V



Draw wave diagram of current  $I_R$ ,  $I_L$ ,  $I_{Total}$

30 60 90° 120 150 180° 210° 240 270 300° 330° 360

WAVE DIAGRAM OF CURRENT  
 $I_R/I_L$  &  $I_{TOTAL}$

TECHNICAL DRG  
NO, 52

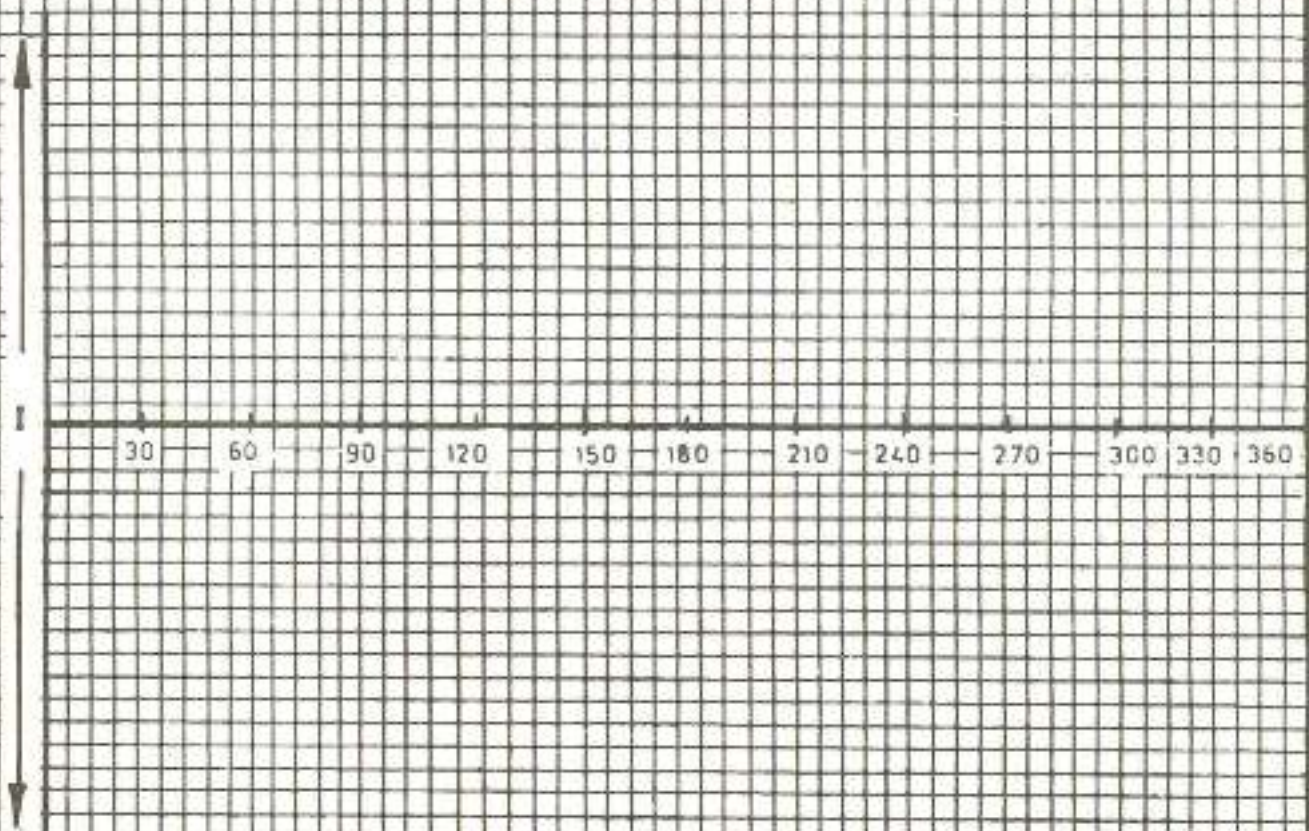


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T. V

Draw line diagram of  $I_R$   $I_C$   $I_{\text{Total}}$



LINE DIAGRAM OF  $V_R$   $V_L$  &  $V_{\text{TOTAL}}$

TECHNICAL DRG.  
NO. 53



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

Draw line diagram of  $V_R$   $V_C$   $V_{Total}$  (voltage in R,C series connection)

V

30 60 90 120 150 180 210 240 270 300 330 360

LINE DIAGRAM OF  $I_R$   $I_L$  &  $I_{TOTAL}$

TECHNICAL DRG.  
NO. 54



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

Draw diagram of voltage  $V_R$ ,  $V_L$ ,  $V_C$  and  $V$  total

30 — 60 — 90 — 120 — 150 — 180 — 210 — 240 — 270 — 300 — 330 — 360

WAVE DIAGRAM OF VOLTAGE  
 $V_R$   $V_L$   $V_C$  &  $V_{TOTAL}$

TECHNICAL DRG.  
NO. 55

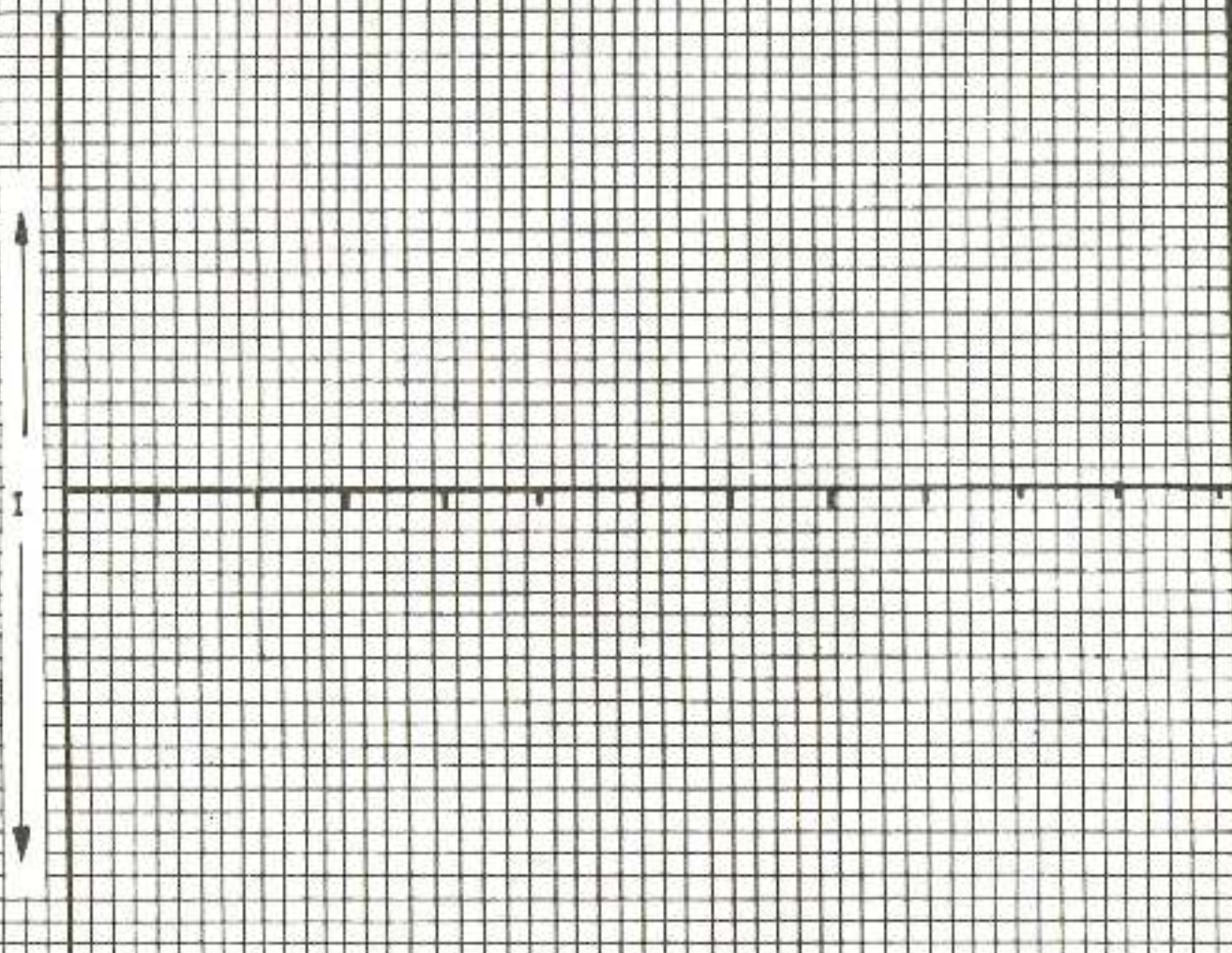


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAR-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T-V

Draw wave diagram of current  $I_R$ ,  $I_L$ ,  $I_C$  and  $I_{\text{total}}$  in R.L.C parallel connection



WAVE DIAGRAM OF CURRENT  
 $I_R$   $I_L$   $I_C$  &  $I_{\text{TOTAL}}$

TECHNICAL DRG.  
NO 56

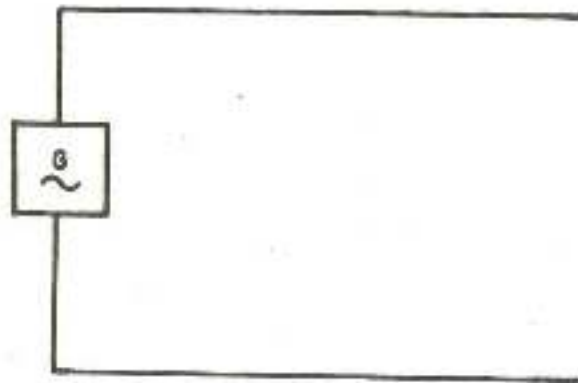


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

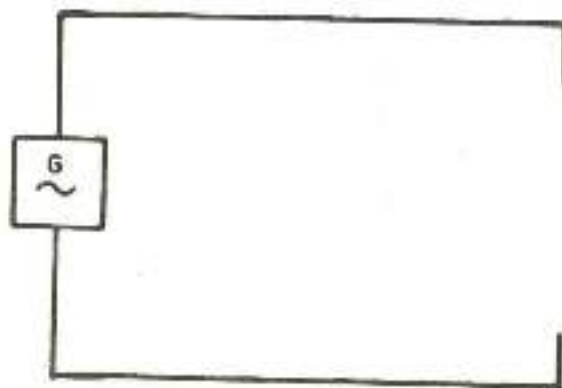
PAK GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

DRAW CIRCUIT DIAGRAM OF SERIES RESONANT CIRCUIT



DRAW CIRCUIT DIAGRAM OF PARALLEL RESONANT CIRCUIT



SERIES & PARALLEL RESONANCE

TECHNICAL DRG  
NO. 57



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

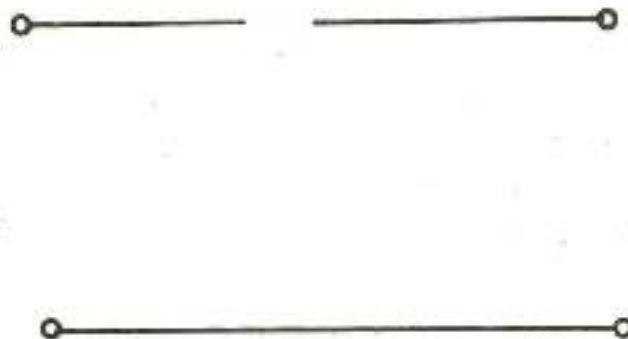
P&H GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

COMPLETE CIRCUIT OF R.C LOW PASS FILTER



COMPLETE CIRCUIT OF R.L LOW PASS FILTER



$R_C$  &  $R_L$  LOW PASS FILTER

TECHNICAL DRG.  
NO. 58



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

DRAW CIRCUIT DIAGRAM OF R.C HIGH PASS FILTER



DRAW CIRCUIT DIAGRAM OF R.L HIGH PASS FILTER



$R_C$  &  $R_L$  HIGH PASS FILTER

TECHNICAL DRG.  
NO. 59



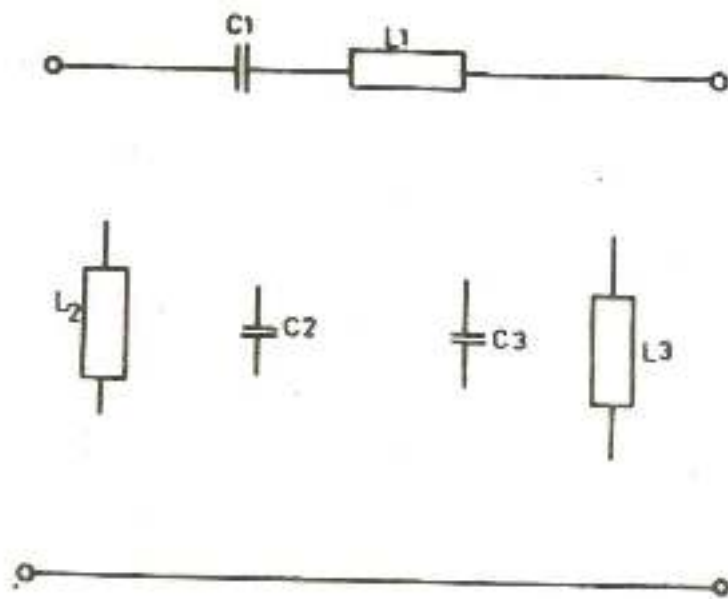
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V



COMPLETE CIRCUIT DIAGRAM OF BAND PASS FILTER



COMPLETE CIRCUIT DIAGRAM OF BAND STOP FILTER

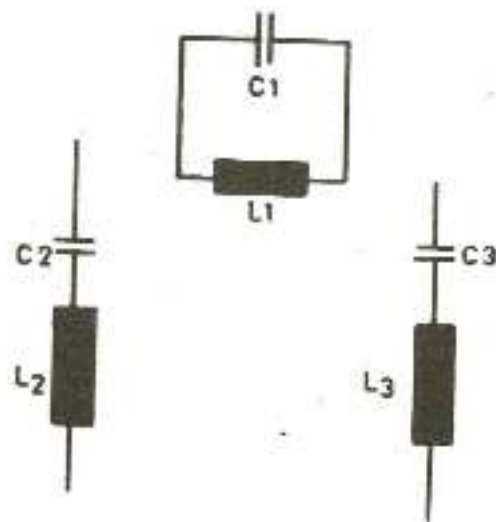


DIAGRAM OF BAND PASS  
&  
BAND STOP FILTER

TECHNICAL DRG.  
NO 60



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

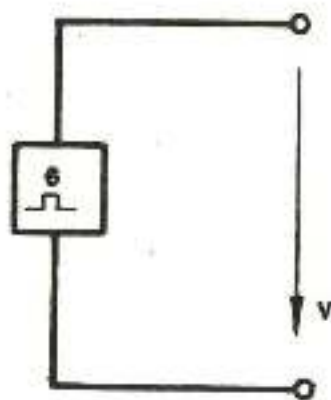
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

COMPLETE INTEGRATING CIRCUIT



COMPLETE DIFFERENTIATING CIRCUIT



INTERGRATING & DIFFERENTIATING  
CIRCUIT

TECHNICAL DRG.  
NO. 61



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

PRESENTATION OF RISE TIME  $t_r$  FALL TIME  $t_f$  ON INTEGRATING PULSE

V(v)

10

7.5

5

2.5

→ t

DRAW PULSE OF TIME ( $t_p$ ) BREAK TIME PULSE ( $t_b$ ) AND DURATION OF PULSE (T)

4456 & DURATION OF PULSE  
(t) ON INTEGRATING PULSE

TECHNICAL DRG.  
NO. 62

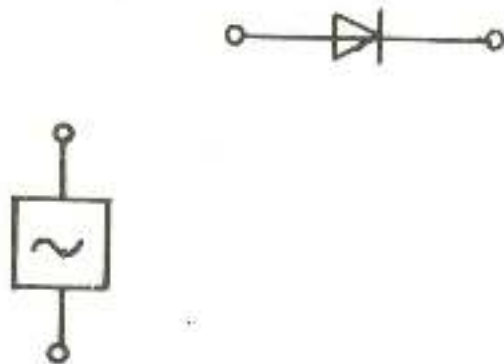


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

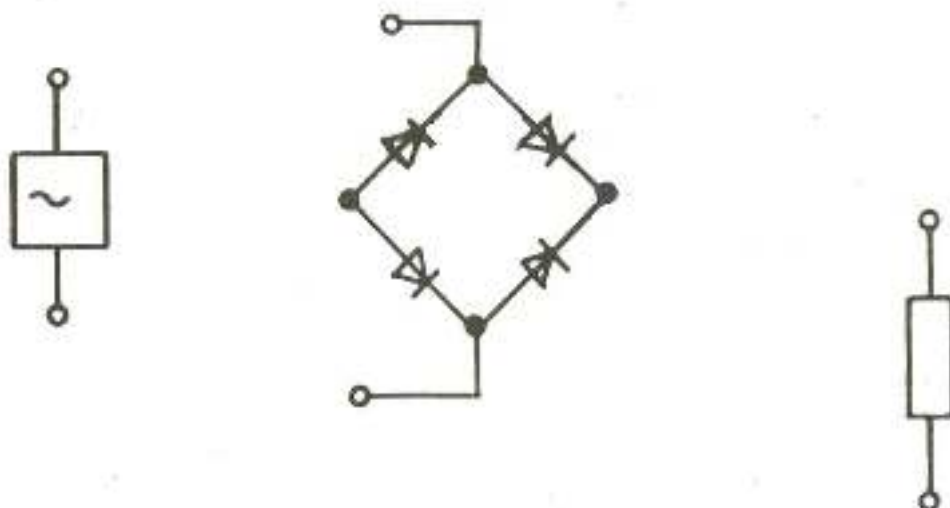
PAK GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

COMPLETE CIRCUIT OF HALF WAVE RECTIFIER



COMPLETE CIRCUIT OF FULL WAVE RECTIFIER (BRIDGE TYPE)



HALF WAVE & FULL WAVE  
RECTIFIER

TECHNICAL DRG.  
NO. 63

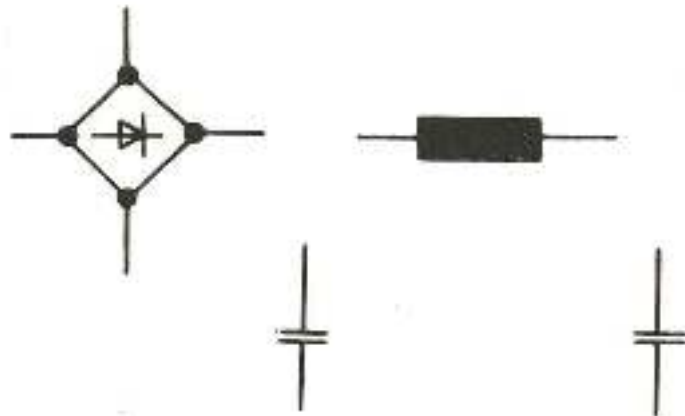


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

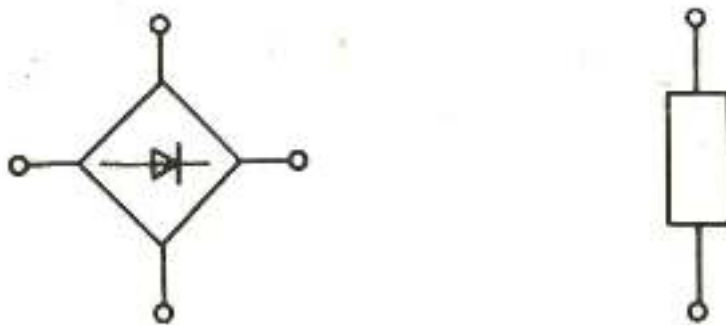
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

COMPLETE DIAGRAM FOR RECTIFIER WITH LC FILTER CIRCUIT



COMPLETE DIAGRAM FOR RECTIFIER WITH RC FILTER CIRCUIT



RECTIFIER WITH  $R_L$  &  $R_C$  FILTER  
CIRCUIT

TECHNICAL DRG.  
NO. 64

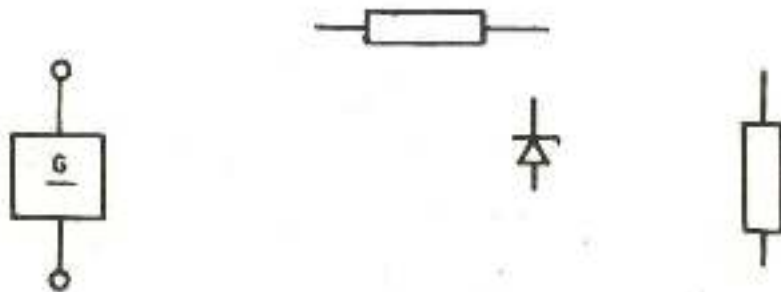


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

COMPLETE DC VOLTAGE STABILIZER CIRCUIT WITH Z-DIODE



DRAW RECTIFIER CIRCUIT WITH CHARGING, CAPACITOR  
RESISTANCE AND Z-DIODE

VOLTAGE STABILIZER CIRCUIT WITH  
Z-DIODE

TECHNICAL DRG.  
NO. 65

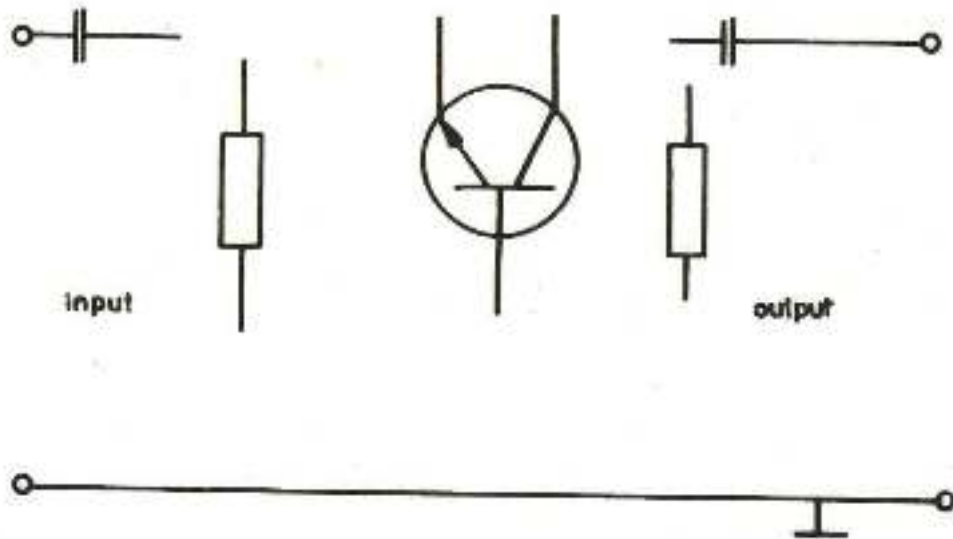


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

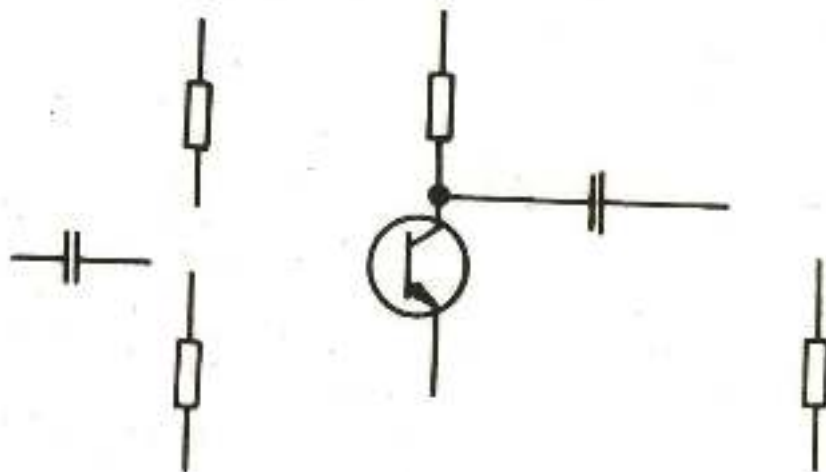
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

COMPLETE DIAGRAM OF COMMON BASE CIRCUIT



COMPLETE DIAGRAM OF COMMON EMITTER CIRCUIT



COMMON BASE & EMITTER CIRCUIT

TECHNICAL DRG.  
NO. 66

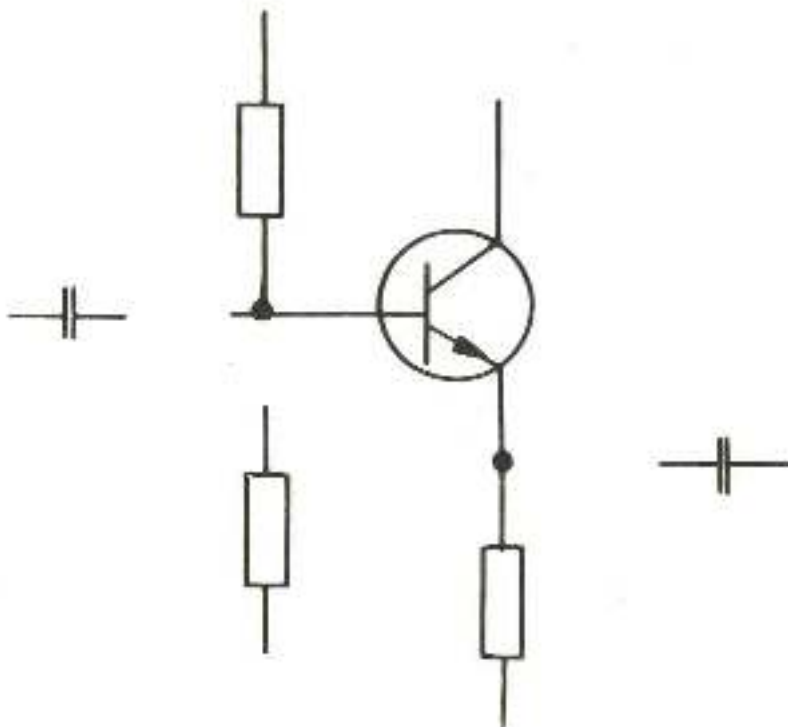


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

COMPLETE DIAGRAM OF COMMON COLLECTOR CIRCUIT



COMMON COLLECTOR CIRCUIT

TECHNICAL DRG  
NO. 67



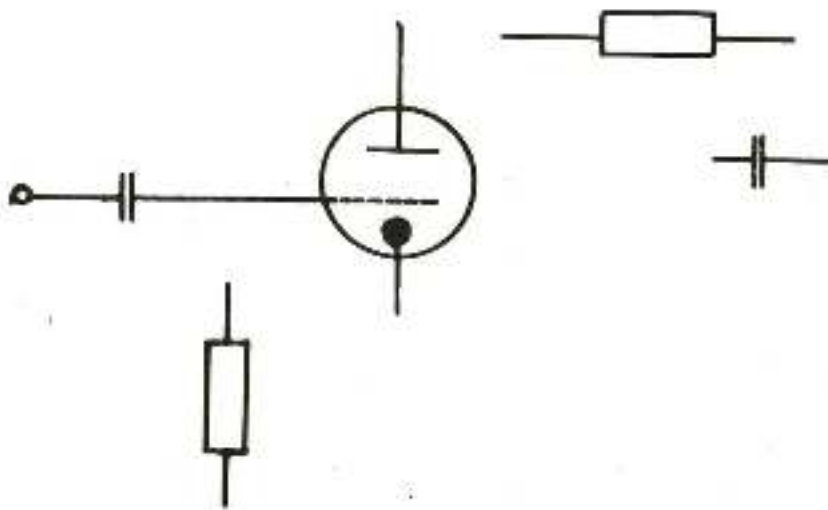
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMA TECHNICAL TRAINING PROGRAMME

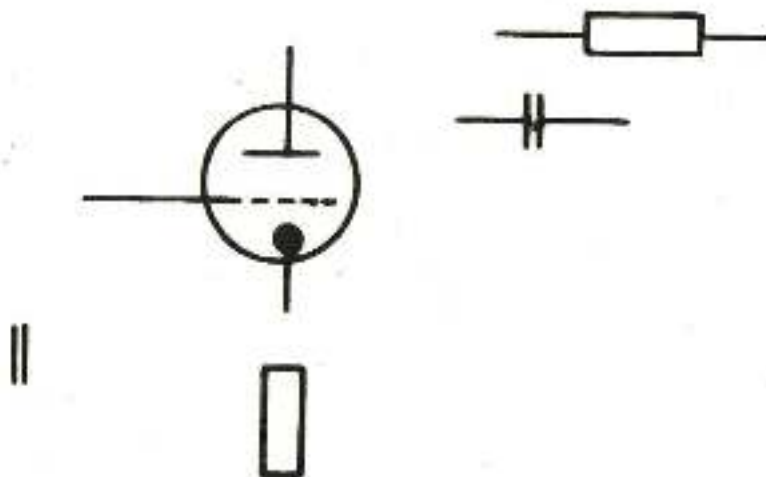
Radio  
&  
T-V



COMPLETE DIAGRAM OF GROUNDED CATHODE CIRCUIT TYPE



COMPLETE DIAGRAM OF GROUNDED GRID CIRCUIT



**GROUNDED CATHODE & GRID CIRCUIT**

TECHNICAL DRG.  
NO. 68

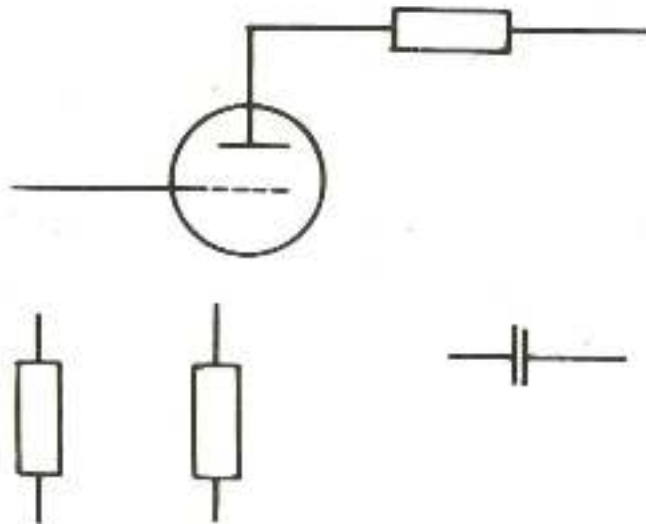


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

FAK - GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T. V

COMPLETE DIAGRAM OF GROUNDED ANODE CIRCUIT



**GROUNDED ANODE CIRCUIT**

TECHNICAL DRG  
NO. 69

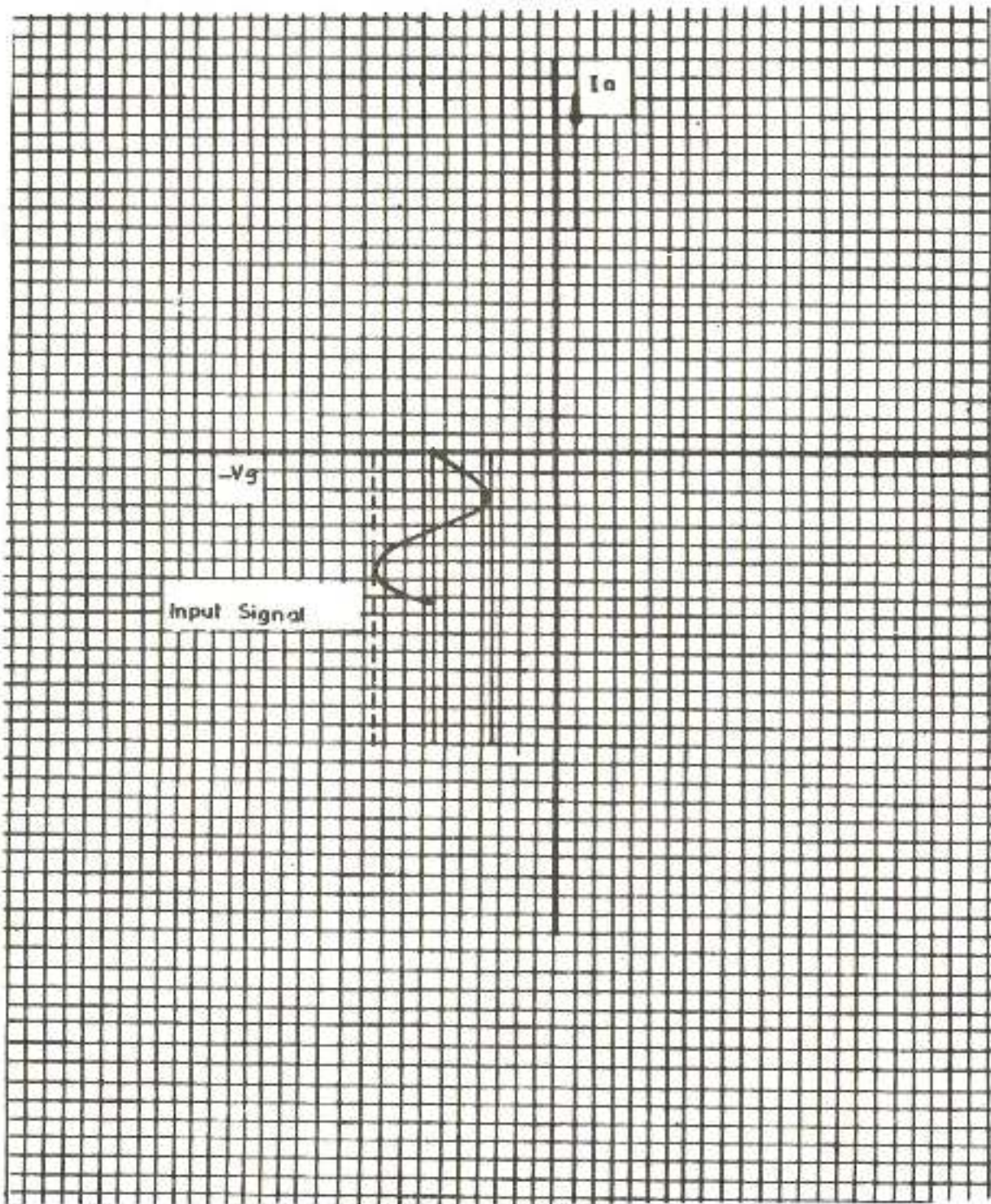


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T-V

Draw the characteristic curve with operational point of class "A" amplifier



CURVE WITH OPERATIONAL POINT  
OF CLASS 'A' AMPLIFIER

TECHNICAL DRG  
NO. 70

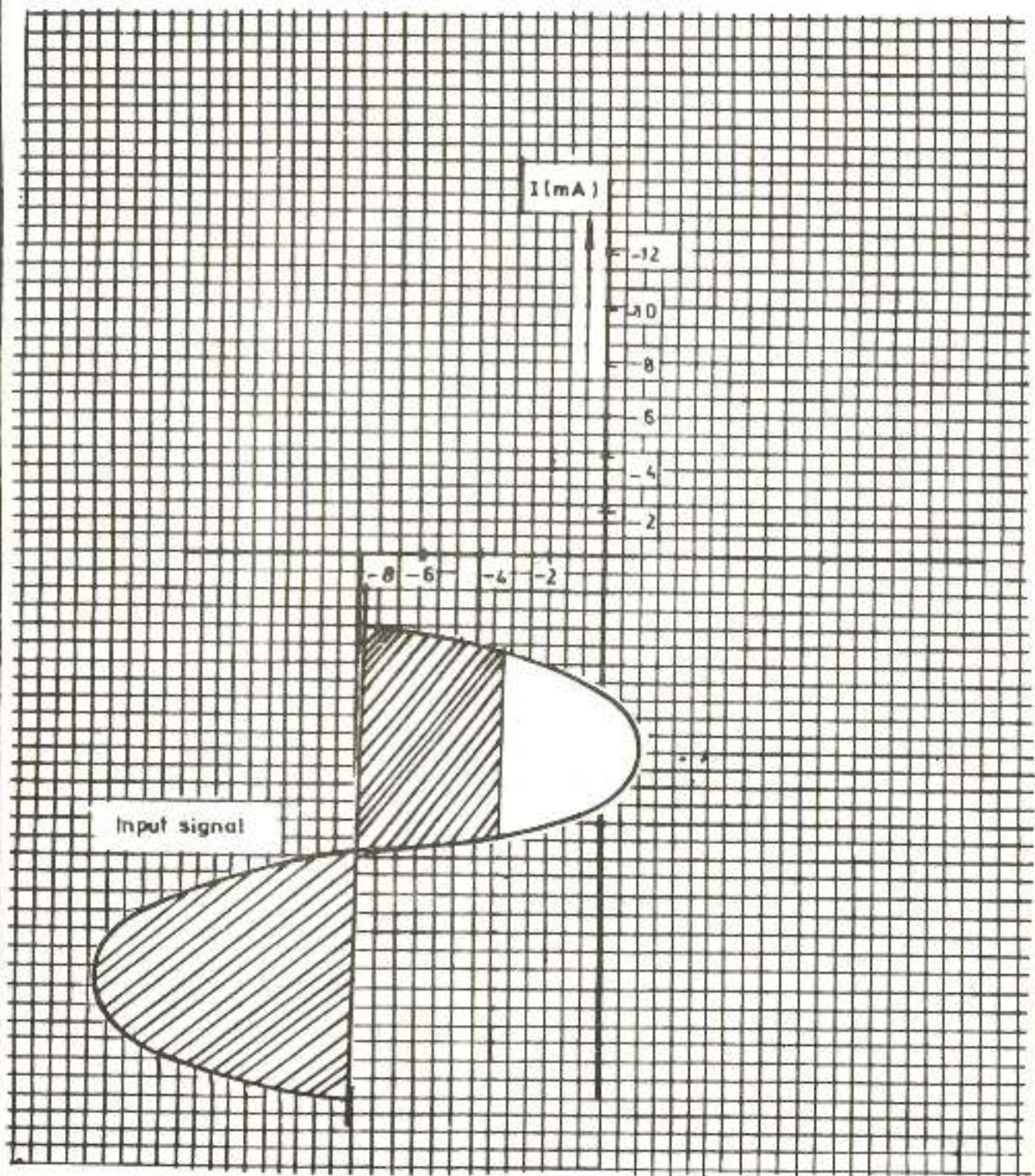


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

Draw the characteristic curve with operational point of class "C" amplifier



CURVE WITH OPERATIONAL POINT OF CLASS 'C' AMPLIFIER

TECHNICAL DRG. NO. 71

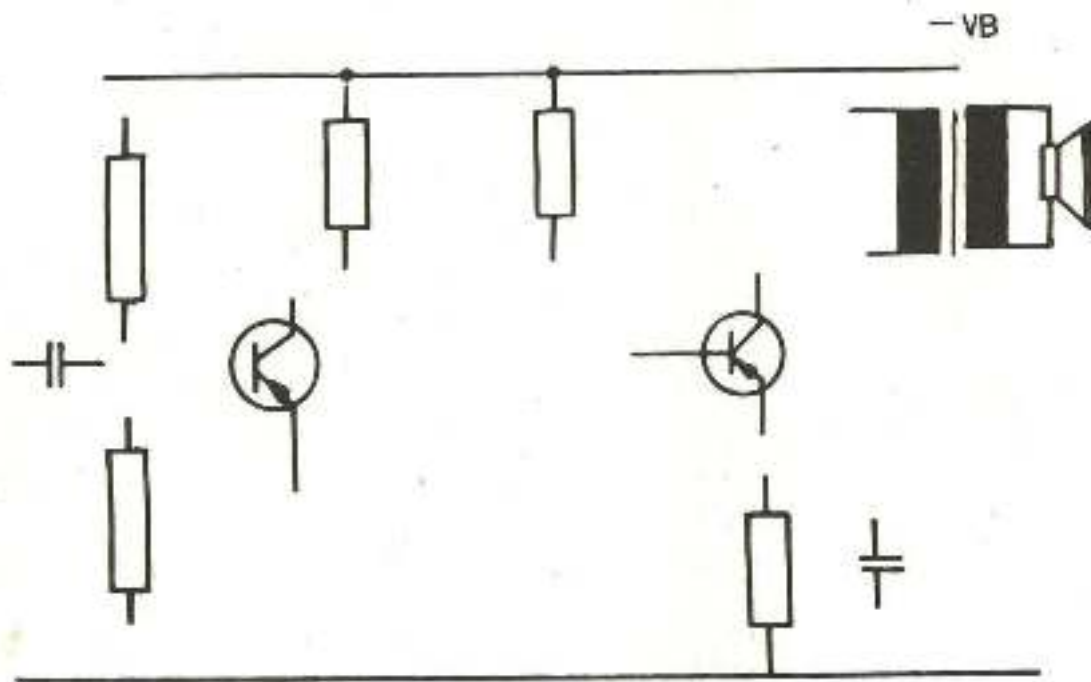


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

FOR GERMAN TECHNICAL TRAINING PROGRAMME

Radio & T.V

DRAW CIRCUIT DIAGRAM OF SINGLE ENDED AMPLIFIER



SINGLE ENDED AMPLIFIER  
( TRANSISTORIZED )

TECHNICAL DRG.  
NO. 72

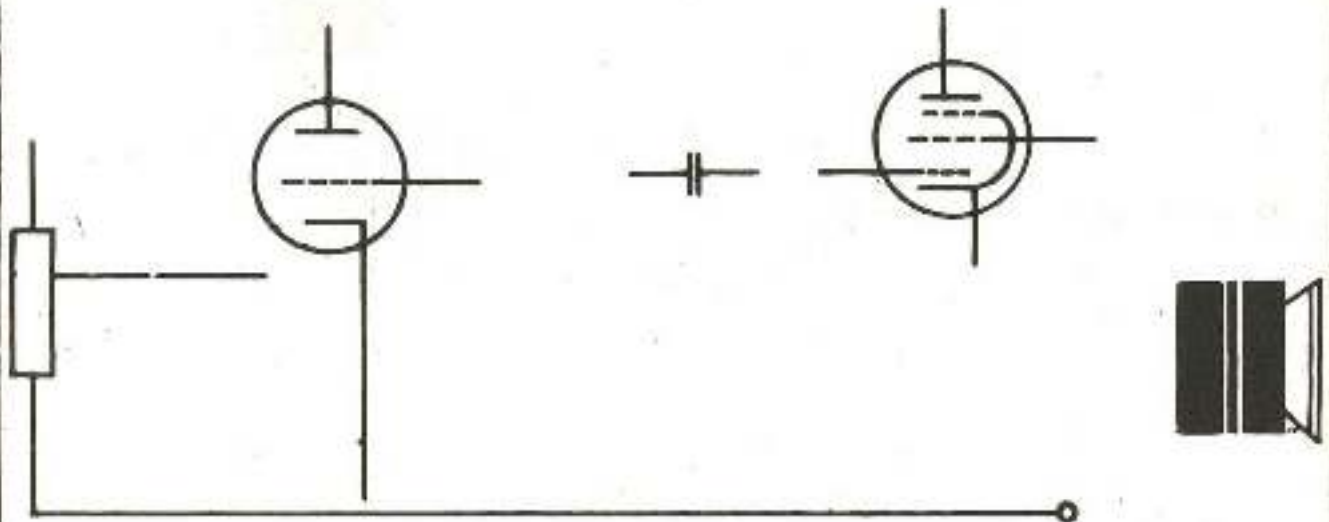


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T. V

DRAW CIRCUIT DIAGRAM OF SINGLE ENDED AMPLIFIER



**SINGLE ENDED AMPLIFIER  
(VALVE)**

TECHNICAL DRG  
NO. 73

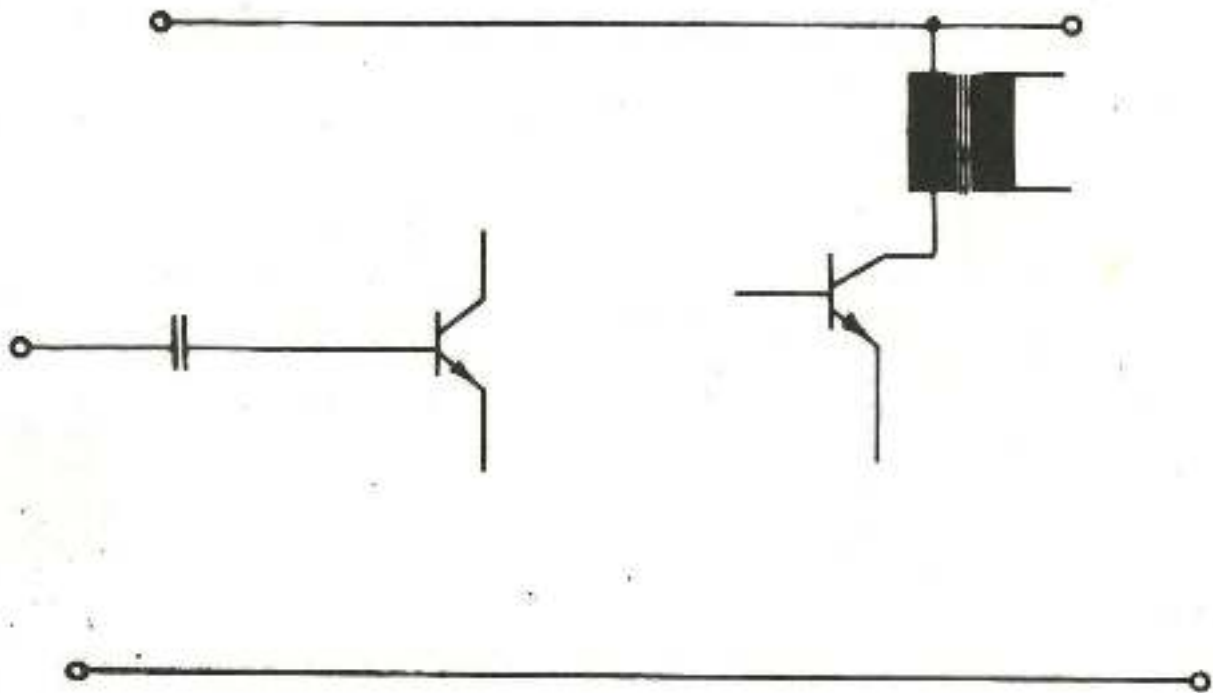


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

DRAW CIRCUIT DIAGRAM OF SINGLE ENDED MULTI STAGE  
TRANSISTORIZED AMPLIFIER



SINGLE ENDED MULTISTAGE  
AMPLIFIER ( TRANSISTORIZED )

TECHNICAL DRG.  
NO. 74

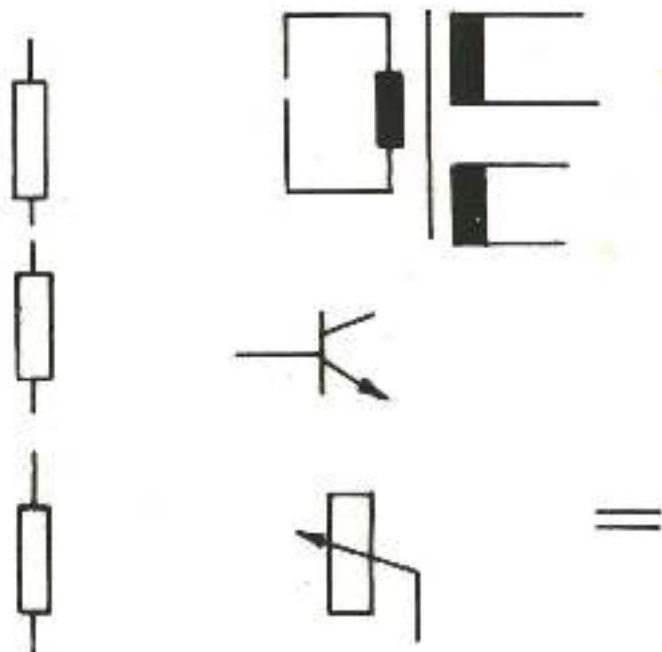


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

FAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

COMPLETE CIRCUIT DIAGRAM OF ARM STRONG OSCILLATOR



ARMSTRONG OSCILLATOR

TECHNICAL DRG.  
NO. 75



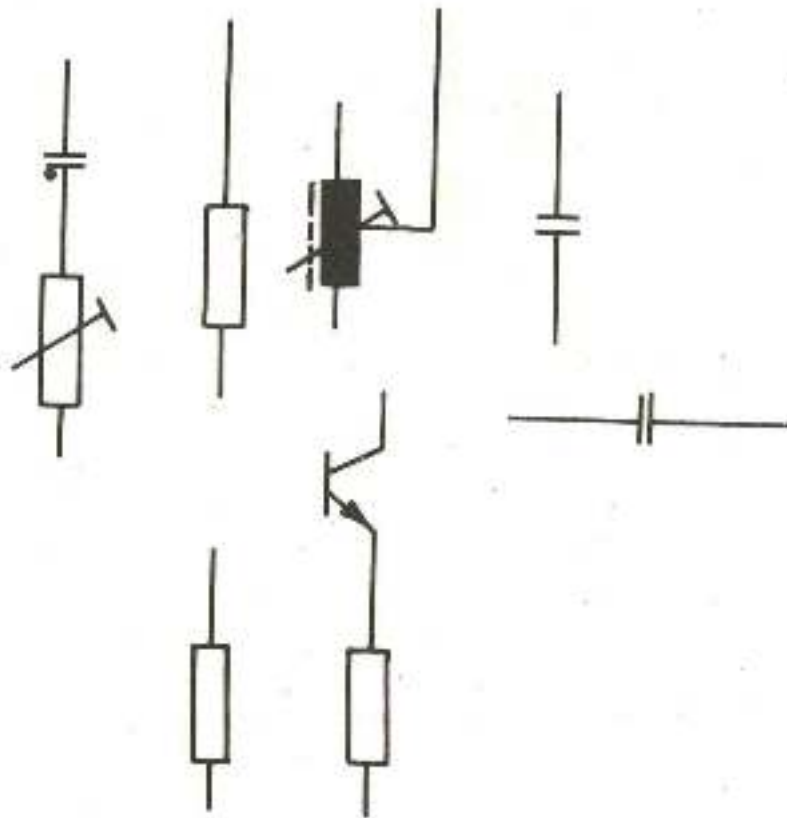
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

FAK GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T-V



COMPLETE CIRCUIT DIAGRAM OF HARTLEY OSCILLATOR



HARTLEY OSCILLATOR

TECHNICAL DRG.  
NO. 76

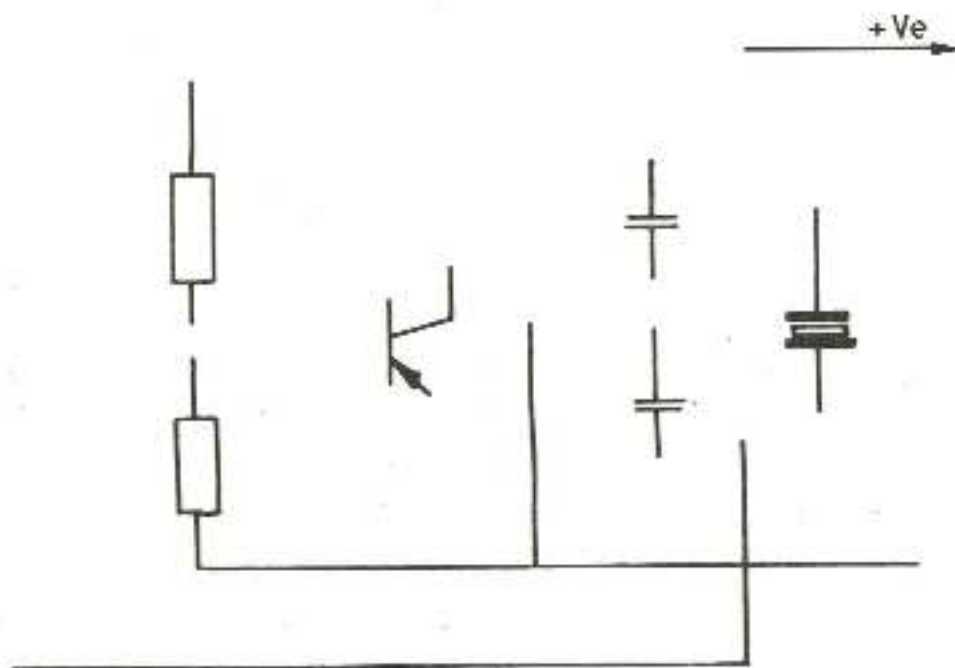


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

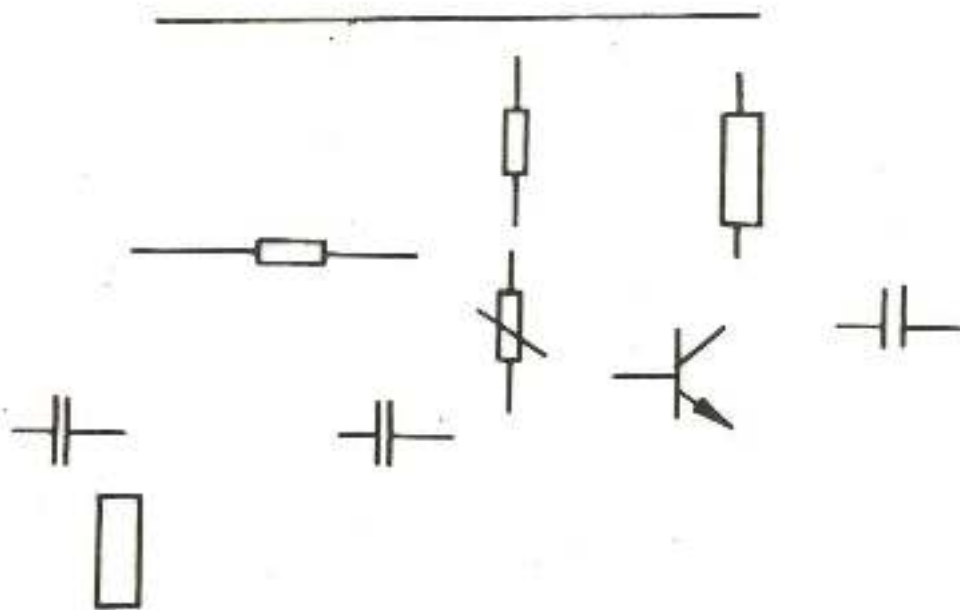
FAN GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

COMPLETE CIRCUIT DIAGRAM OF CRYSTAL OSCILLATOR



COMPLETE CIRCUIT DIAGRAM OF R.C. GENERATOR



CRYSTAL & R.C. OSCILLATOR

TECHNICAL DRG  
NO:77

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

DRAW BLOCK DIAGRAM OF TRF

DRAW BLOCK DIAGRAM OF SUPERHETERODYN RECEIVER

**TRF & SUPERHET. RECEIVER**  
( BLOCK DIAGRAM )

TECHNICAL DRG.  
NO. 80

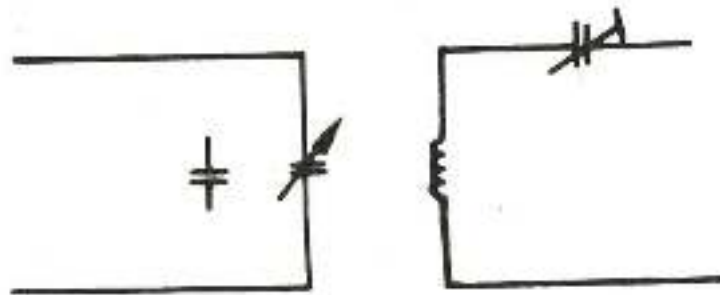


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

COMPLETE CIRCUIT DIAGRAM OF R.F TUNING STAGE



R. F TUNING STAGE

TECHNICAL DRG.  
NO. 81

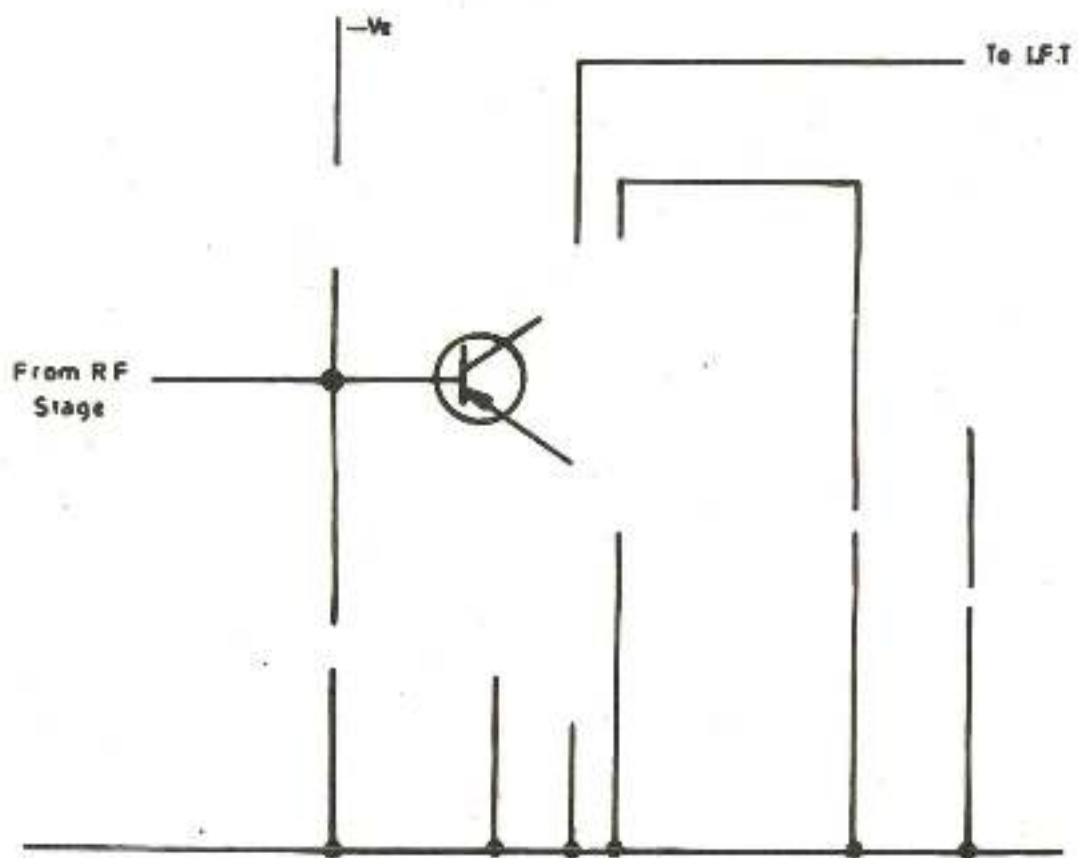


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T. V

COMPLETE CIRCUIT DIAGRAM OF OSCILLATOR AND MIXER STAGE



R. F OSCILLATOR & MIXER STAGE

TECNICAL DRG.  
NO.82

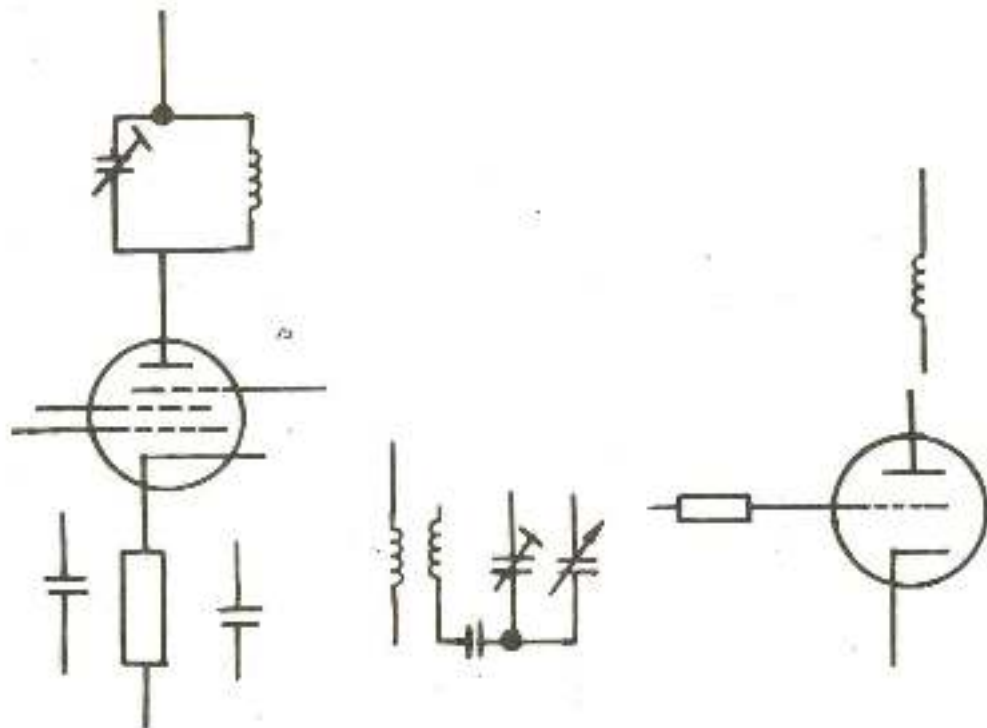


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T. V

COMPLETE CIRCUIT DIAGRAM OF OSCILLATOR AND MIXER  
STAGE VALVE TYPE



R. F OSCILLATOR & MIXER STAGE

TECHNICAL DRG.  
NO. 83

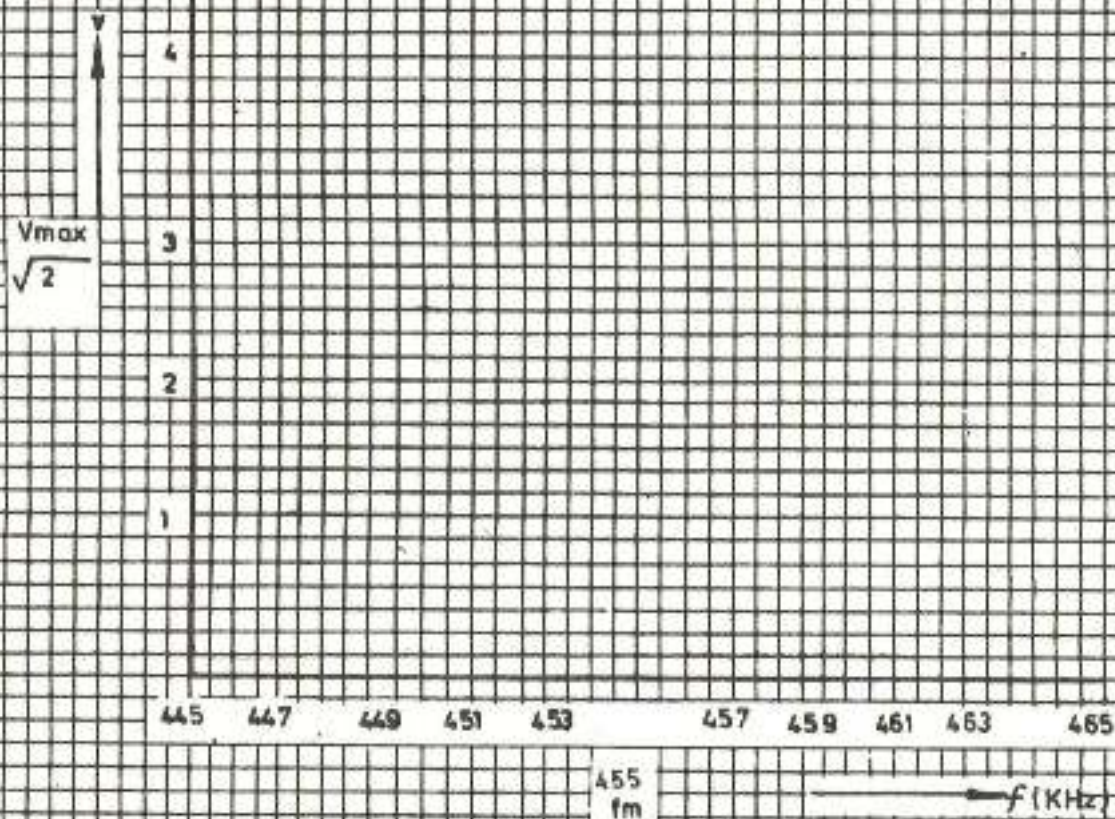


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T. V

Draw diagram of frequency response of IF amplifier



FREQUENCY RESPONSE OF  
I-F AMPLIFIER

TECHNICAL DRG.  
NO. 84

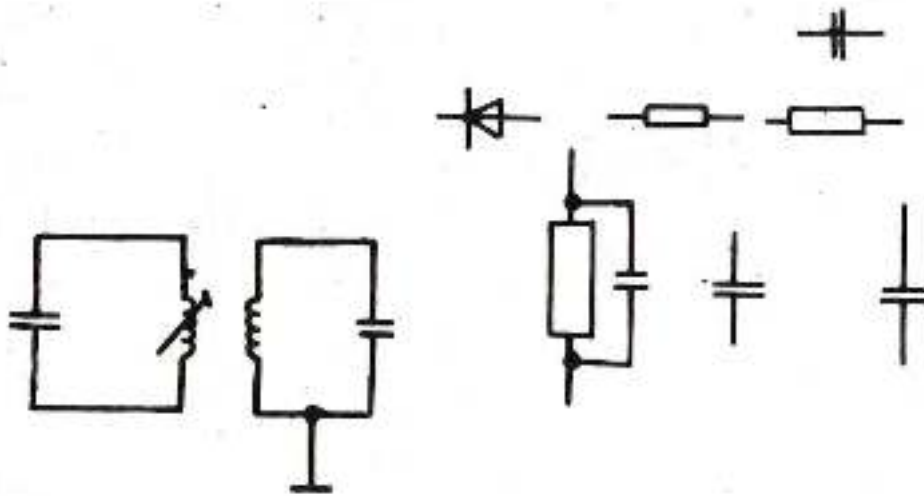


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

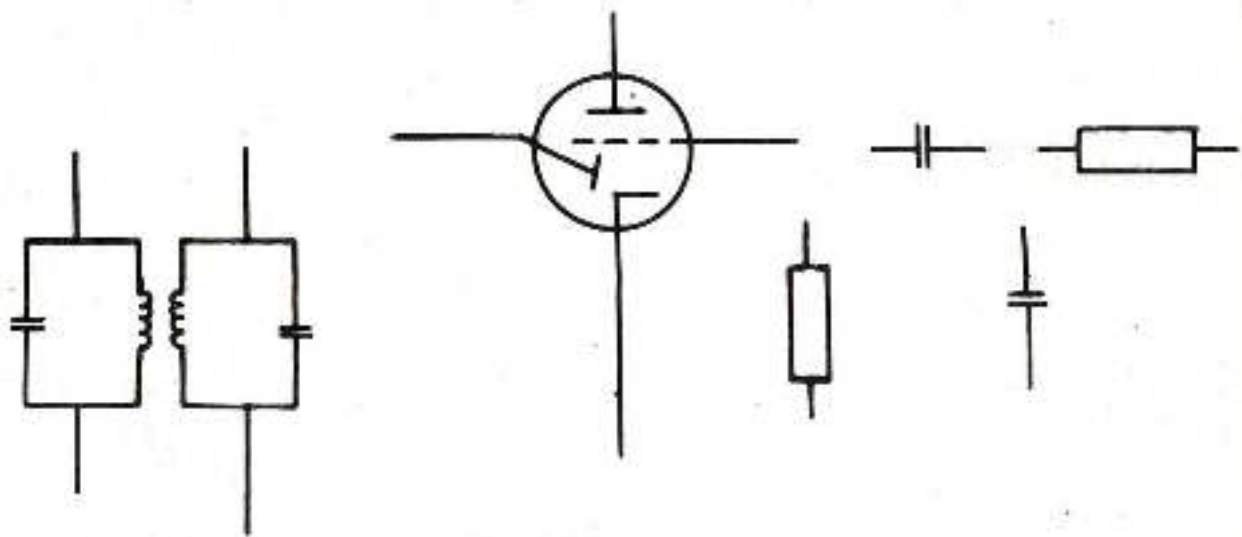
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V

COMPLETE CIRCUIT DIAGRAM OF AM DEMODULATOR  
(SEMI-CONDUCTOR TYPE)



COMPLETE CIRCUIT DIAGRAM OF AM DEMODULATOR VALVE TYPE



AMPLITUDE DEMODULATOR

TECHNICAL DRG.  
NO. 85



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Radio  
&  
T.V



