4. RADIO & TV TECHNICIAN

1. INTRODUCTION

This Technician level course in Radio & Television field will rouse keen interest in learning skills for those who like it. School dropouts who cannot continue their education, can take up this trade and settle as a skilled technician in this field.

2. OBJECTIVES OF THE COURSE

1. Know the various electronic components.
2. Understand the assembly of parts as per the given circuit.
3. Fabricate circuits for various uses.
4. Identify the faults in any electronic circuit and able to rectify.

3. SKILLS TO BE PROVIDED

1. Can be able to identify the electronic components.
2. Able to prepare list of components for a given circuit.
3. Assemble the parts as per circuit.

4. EMPLOYMENT OPPORTUNITIES

[A] WAGE EMPLOYMENT

1. Electronic servicing shops.
2. Information and Public Relation Department.
3. Television Studio.

[B] SELFEMPLOYMENT

Can run own servicing shop.

5. Schemes Of Instruction Per Module

Module	Theory		On Job Training		Total	
	Hours	Weightage	Hours	Weightage	Hours	Weightage
I	72	30	216	70	288	100
Total	72	30	216	70	288	100

Schemes Of Instruction Per Week

Module	Theory	On the Job Training	Total
Modules I/II/III	6 Hours	18 Hours	24 Hours

6. SYLLABUS

MODULE – I
STUDY OF ELECTRONIC COMPONENTS

Week	Theory	On the Job Training
I	Identification of resistors a. Carbon film resistors b. Metal film resistors c. Wire wound resistors d. Variable linear, logarithmic (volume controllers)	Colour code Identification of 1 w, 1w, 1w, ----- ----- ---- 1w, 2 w 8 4 2 Resistors with Colour code (carbon, metal film) wire wound resistors 5w to 1000w identification Both fixed & variable.
II	Multimeter Measurement of resistance, current, voltage (AC, DC) with different ratings	Measurement of resistance with Analog & Digital Multimeter with different ratings Voltage measurement AC, DC, current measurement AC&DC voltages, switches testing & Applications.
III	Inductors and transformers AF, RF, HF coils power transformers step up, step down EHT transformer AF, RF,HF, IFT's.	Identification of coils Range – AF,RF,HF, identification of transformer winding & leads Primary & Secondary with tapping terminals. Identification of AF, RF, HF, IFT's and applications.
IV.	**Capacitors**: Colour coding of capacitors & types – Paper, Mica, Ceramic, Electrolytic, Polystyrene capacitors. **Switches & Fuses**: a) Types – SPST,SPDT, DPST,DPDT b) Fuses with different current ratings	Identification of capacitance with Colour code, testing of capacitor with Multimeter Identification of different types of capacitors. Identification of switches, testing with meter (digital & analog) Identification of poles continuity with switches OFF & ON position Identification of fuses, testing with meter.
V.	Wires and cables Types – Ribbon cable, single, stand wire, feeder, wire coaxial cable, power chords with different current ratings Adaptors connectors.	Identification of wires single, Ribbon, cable, feeder wire, coaxial cable, power chords with different current ratings. Study of different types of adaptors, connectors, testing with meter.
VI	Microphones and loudspeakers a) Types of Microscopes carbon, condenser, dynamic, Ribbon, crystal chordless Mikes. Types of Land Speakers. PMMC (Dynamic), Horn Loud Speaker, woofer, tweeter, Mid Range, Column Speakers.	Identification of Microphones different types – Carbon, Condenser, dynamic, Ribbon, Crystal, chordless – Testing with meter. Identification of different speakers – PMMC, Horn, Woofer, tweeter, Mid Ranges, column speaker – Identification of different parts of a speaker – Testing with meter.

VII.	Semi conductors Diodes – PN Junction Diode, Zener, Diode, Tunnel Diode, LED, Varicap – Application. Transistors PNP, NPN – different types.	Identification and testing of PN junction Diode, Zener Diode, Tunnel Diode, LED, Varicap. Study of characteristics, Data sheets. Identification of transistor leads, Study of CB, CE, CC characteristics Testing of Transistor with meter Study of Data sheets.
VIII.	SCR, DIAC, TRIAC, FET (Families) UJT symbols, characteristics and Application.	Identification of SCR, DIAC, TRIAC, FET, and UJT leads. Study of characteristics on demonstration Boards, Data sheets Testing of above devices with meter
IX.	-DO- with data sheets	Study and Applications
X.	Power supplies Half wave, full wave, Bridge rectifies with filters – type. L – type, LC filters Applications a. Zener diode regulator b. Transistorized regulator.	Assembling of Half wave, Full wave, Bridge Rectifier using Filter circuits. Assembling and testing of regulated power supply. a. Zener diode b. Transistorized
XI.	Amplifiers (AF,RF and HF) Amplifiers with different types of coupling RC, RL, LC, Transformer coupling, direct coupled amplifiers.	Identification of Amplifiers based on coupling RC, RL, LC, transformer coupling.
XII	Servicing tools & instruments Assembling of circuits Wiring of the components on the PCB	Study of Nose pliers, cutting pliers, screw driver set, preset driver set, files. Identification of soldering Iron, working lead, paste, cutter, de-soldering pump. Soldering practice on PCBs Fixing of Switches, capacitors, transformers, fuses, front panel controls on cabinet. Wiring of resistors, capacitors, coils, transformers, switches, fuses, microphones loud speakers on the PCB.

MODULE – II
INTRODUCTION TO IC's

Week	Theory	On the Job Training
I	Multi stage Amplifiers Applications	Identification of Multi Stage Amplifiers – Testing.
II	Oscillators – types Hartley, Colpritts, tuned collector, RC Phase shift, wein Bridge Oscillators – Applications.	Testing of different types of oscillators Hartley, Colpritts, Tuned Collector, RC Phase shift, wein bridge oscillator.
III.	Classification of IC's – SSI, MSI, LSI, VLSI used in Radio, tape recorder, stereos, TV's.	Identification of IC's Pin diagram, Identification of Analog and Digital IC's used in Radio, Tape Recorder and TV's Study of IC Data sheets
IV	Radio Receivers transistor Radios.	Study of Transistor Radios Identification of Stages Mixer, Oscillator, RF, IF Detector, AF Power Output, Loud speaker.
V.	Radio receivers IC based tracking, Tuning Tape recorder	Identification of IC's used in Radios. Tracking & Tuning Radio. Identification of tape Recorder circuit – Identification of common stages in Radio- cum-Taper Recorder. Tape Transport Mechanism.
VI	Two-in-one Radio-cum-Tape Recorder.	Identification of IC's used in two-in-one's Data sheets Identification Servicing controls Fault finding.
VII	Stereo System IC based with different power ratings.	Identification of Stereo System – Circuit with Block diagram – working of each block – fault finding methods.
VIII	Black & white TV 14" and 18"	Identification of different stages of B/W TV 14" & 18" with servicing controls using kits on demonstration models. Fault Finding.
IX	Colour TV 14" and 18" Receivers	Identification of different blocks in a Colour TV receivers 14" and 18" with servicing controls using Demonstration kits – Fault Finding.
X	Electronic Appliances – Emergency Light Electronic Stabilizer Battery Eliminator	Study of Emergency Light, Electronic Stabilizer, Battery Eliminator circuits, with servicing controls – Fault Finding.

XI	Inverters, Servo Stabilizers – UPS Maintenance	Identification of Inverter with block diagrams, servicing controls – Fault Finding. Identification of stages of Servo Stabilizer UPS with servicing controls – Fault finding.
XII	Telephones a. Landline Telephone b. Cordless phone c. Wireless phone d. Cell phone e. Will phone	Identification of PCB's used in different types of phones – Fault finding Procedures of each one them.

MODULE – III
MAINTENANCE OF ELECTRONIC DEVICES

Week	Theory	On the Job Training
I	Maintenance and servicing of radio receivers' demonstration.	Maintenance and servicing of Radio Receivers – Fault finding procedures – Rectification methods - 6 days
II	Maintenance and servicing of Tape recorder demonstration	Maintenance and servicing of tape recorder fault finding procedures Rectification methods - 6 days.
III	Maintenance and servicing of Stereo systems demonstration.	Maintenance and servicing of Stereo fault finding procedures Rectification methods - 6 days
IV	Maintenance and servicing of speaker boxes, uses and applications Demonstration	Maintenance and servicing of speaker boxes, fault finding – Rectification methods - 6 days
V	Maintenance and servicing of Stabilizers demonstration	Maintenance and servicing of Stabilizer fault finding – Rectification methods - 6 days
VI	Maintenance and servicing of Telephone, cell phone demonstration	Maintenance and servicing of telephone, cell phone fault.
VII	Maintenance and servicing of Emergency light-demonstration	Maintenance and servicing of Emergency light-fault finding – Rectification methods - 6 days
VIII	Inverters & UPS Maintenance and servicing procedures – Demonstration	Maintenance and servicing of Inverters & UPS fault finding procedures Rectification methods – 6 days
IX	B/W TV Receivers – 14", 18" models Maintenance & servicing procedures	Maintenance and servicing of B/W TV receivers fault finding – Rectification methods - 6 days
X	Colour TV receivers 14",18" models Maintenance and servicing procedures – Demonstration.	Maintenance and servicing of Colour TV Receivers fault finding – Rectification methods - 6 days
XI	VCP, VCR, Panel controls and servicing controls demonstration	Setting of panel controls and servicing controls of VCP, VCR maintenance of VCP,VCR Rectification methods - 6 days
XII	CD Players – Panel controls and servicing controls – Demonstration	Setting of Panel controls and servicing controls of CD players maintenance of CD players Rectification methods – - 6 days

7. LIST OF TOOLS AND EQUIPMENT REQUIRED

Cutting player	-	5 Nos.
Nose pliers	-	5 Nos.
Nose cutters	-	5 Nos.
Tweezers	-	5 Nos.
IC tweezers	-	5 Nos.
Screw Driver set	-	5 Nos.
Preset Driver	-	5 Nos.
Knives	-	10 Nos.
Adjustable spanner	-	10 Nos.
Work benches	-	10 Nos.
Soldering rods 25w, (with stand)	-	10 Nos.
Soldering rods 60w, (with stand)	-	10 Nos.
De-solder pump	-	10 Nos.
Files	-	10 Nos.
Transistorised regulated Power Supply (0-3oV,1A)	-	5 Nos.
Rheostats (Potentio meter) (10W)	-	5 Nos.
Multimeters (Analog)	-	10 Nos.
Multimeters (Digital) Samsung	-	10 Nos.
CRO (20MHZ)	-	2 Nos.
Digital Frequency Counter	-	2 Nos.
Digital L.C.R. Meters	-	5 Nos.
AF Power output meters	-	2 Nos.

EXPERIMENTAL BOARDS

PN Junction Diode Board	-	2 Nos.
Zener Diode	-	2 Nos.
Transistor characteristics	-	2 Nos.
2 stage RC coupled Amplifier	-	2 Nos.
SCR Characteristics Board	-	2 Nos.
UJT Characteristics Board	-	2 Nos.
FET Characteristics Board	-	2 Nos.
Tuned Collector Oscillator Board	-	2 Nos.
Hartley oscillator Board	-	2 Nos.
Colpitts oscillator Board	-	2 Nos.
Crystal oscillator Board	-	2 Nos.
Wein bridge oscillator Board	-	2 Nos.
Push pull Amplifier Board	-	2 Nos.
Class A Power Amplifier Board	-	2 Nos.
Class B Power Amplifier Board	-	2 Nos.
Class C Power Amplifier Board	-	2 Nos.
AM Radio Demonstration Model (Transistorised – 3 Nos., IC based – 3 Nos)	-	6 Nos.
AM, FM Signal Generator	-	2 Nos.
Test Oscillator	-	2 Nos.
Stereo Demonstration model (IC based)	-	2 Nos.
Audio Cassettes	-	50 Nos.
14” B/W Portable TV demonstration model	-	2 Nos.
Colour TV 14” Portable demonstration model	-	2 Nos.
18” B/W TV demonstration model	-	2 Nos.
18” colour TV demonstration model	-	2 Nos.

VCP	-	2 Nos.
VCR	-	2 Nos.
CD Player	-	2 Nos.
CD's (Audio, Video)	-	10 Nos.
Emergency Light (6w, 10w, 20w)	-	12 Nos.
Electronic Stabilizers demonstration model (1AMP – 4 Nos., 5 AMP – 4 Nos.)	-	8 Nos.
Battery Eliminators	-	10 Nos.
Public Address Amplifiers (60w,80w,120w)	-	6 Nos.
Column loud speakers with Cross-over network	-	3 Nos.
Telephone demonstration model (with different models including chordless)	-	10 Nos.
Two-in-one's	-	3 Nos.
Inverters demonstration model	-	5 Nos.
UPS demonstration model	-	5 Nos.
Batteries (charging type) (with suitable current ratings)	-	5 Nos.
IC Testers	-	5 Nos.
Semiconductor data sheets (Diodes, Transistors, IC's depending on the requirement)		

8. QUALIFICATION FOR TEACHING FACULTY

No. of posts: 1 **:** A second-class degree in Engineering B.E./ B. Tech / AMIE with Electronics & Communication Engineering with 50% of marks.

OR

: A First Class Diploma in Electronics and Communication from State Board of Technical Education with 3 years practical experience in Assembling, testing or Servicing maintenance of Electronic Instruments.

OR

: Skilled technician in Electronics field such as Assembling Testing and Servicing maintenance of Electronic Instruments

Lab Assistant: : A 1st Class pass Radio & TV Intermediate Vocational
No.of posts: 1 course or ITI with Electronics / Radio & TV.

9. REFERENCE BOOKS

1. Electronic Components by Sri. D.V. Prasad.
2. Principle of Electronics by Sri. V.K. Mehta.
3. Basic Electronics by Sri. S. Rama Bhandari.

10. LIST OF PARTICIPANTs

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